GLEANINGS IN BEE CULTURE

VOL. XXXVIII. FEBRUARY 1, 1910 No. 3

GREEK MOUNTAINEER GIVING HONEY TRIBUTE TO MACEDONIANS—300 B.C.

PUBLISHED BY
THE A. I. ROOT COMPANY, MEDINA, OHIO, U. S. A.

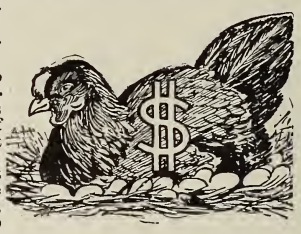
THERE ARE $MILLIONS IN THE POULTRY BUSINESS

SEE HOW IT'S DONE AND GET YOUR SHARE

Uncle Sam estimates this year's Poultry and Egg value at $700,000,000 Nice, tidy sum, isn't it? Juicy melon for somebody—How about your slice?

Fancy the number of fowls required to satisfy a demand aggregating such an enormous figure and then ask yourself if there's any good reason why a good, big share of the profits of this tremendous sum isn't pouring into your pockets?

If you are in the poultry game and not making the money you'd like, what's the reason? If you are in it at fair returns, why not make more? And if you'd like to get in, why not start and go after it right?



Remember, Success in anything depends on knowing how. Some people spend years and skads of money finding out what they might just as well learn at far less cost.

HOW UNCLE SAM HELPS POULTRY RAISERS.

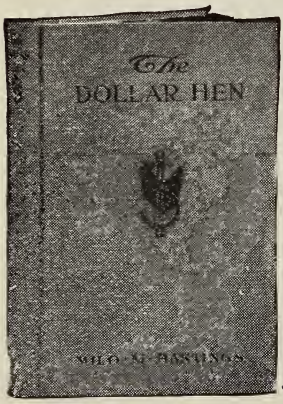
While employed as Government Commercial Poultry Expert, Mr. Milo M. Hastings carefully investigated the great successful poultry plants of the country, their private systems. patent feeds, so-called poultry secrets, etc. This cost the U. S. Government thousands of dollars and much valuable time but resulted in producing the most thoroughly practical and profitable plans for conducting the poultry business known; also the most favorable conditions for doing it. It showed

HOW TO CUT EXPENSES IN HALF,

do away with wasting money on patent feeds, useless systems and expensive equipment. **Not Theory but Facts.** All this valuable information has been carefully and briefly compiled in a handsome book entitled

"THE DOLLAR HEN"

It tells how to make money in the Poultry Business in a plain, common-sense way—not by get-rich-quick schemes—but by practical business methods. IT WILL SHOW YOU YOUR CHANCES OF SUCCESS, on either a large or small scale; where and how to reach the best markets; how to meet the constantly growing demand and the **almost unlimited field;** also a typical money-making poultry farm called **"The Dollar Hen Farm."** In addition to this, over 100 other subjects of vital importance. "The Dollar Hen" tells about The Hen's Ancestors; Chinese Poultry Culture; The Public Hatcheries of Egypt; Recent Discoveries in Incubation; The Causes of Poultry Diseases; Grading, Packing and Storage of Poultry Products; The Fattening Methods of the Big Packers, and Co-operative Egg Marketing. "The Dollar Hen" is practical from cover to cover and has the indorsement of the best poultry authorities; also the poultry press.



HOW TO GET IT.

Send $1.00 for a handsomely bound copy of Mr. Hastings' book "The Dollar Hen" and we will include a 12-months subscription to "The Poultry Digest," **FREE.** Don't miss this splendid offer. Remember, it is a full-bound book—not a paper-covered pamphlet.

POULTRY DIGEST PUBLISHING CO.,

57-G ANN STREET NEW YORK CITY

MEDINA, OHIO, Sept. 15, 1909.

Poultry Digest, New York City—

GENTLEMEN:—My opinion is that "The Dollar Hen" is not only the best book on poultry we have at the present time, but it is worth pretty nearly as much as all the rest together. Perhaps this is extreme; but we have very few books that are strictly up to date, and still fewer that pitch right into the superstitions and humbugs now scattered through our poultry books and journals.

Respectfully, A. I. ROOT.

GLEANINGS IN BEE CULTURE

Published by The A. I. Root Co., Medina, Ohio

H. H. ROOT, Assistant Editor | E. R. ROOT, Editor | A. L. BOYDEN, Advertising Manager
A. I. ROOT, Editor Home Department | J. T. CALVERT, Business Manager

Entered at the Postoffice, Medina, Ohio, as Second-class Matter.

VOL. XXXVIII | FEBRUARY 1, 1910 | NO. 3

EDITORIAL

BY E. R. ROOT.

DID it ever occur to you that a breakfast food tastes better, when honey is used to sweeten it, when it is cold than when hot? Honey poured over any hot food will lose a part of its delicate flavor, consequently the editor has his breakfast food served at the same time with the rest of the family, but eats it last of all, making it a sort of dessert. By that time it has cooled; then he spreads upon it mountain sage or alfalfa honey with a liberal supply of good cream. None of the flavor of the honey is lost, and the breakfast food itself is just as good—yes, even better. Try it, dear reader, and see if you do not agree with us.

NEWSPAPERS and magazines all over the country are discussing the present high cost of living. What is the reason for the oftentimes excessive cost of food? Has honey increased in price proportionately? These and other questions relative to the topic will be dealt with in our next issue by two of our correspondents who are in a position to speak with authority.

The following letter from O. L. Hershiser is timely and to the point:

> It seems to me there is something wrong somewhere when the price of living is getting out of sight and the prices of apiarian products remain stationary. I want to see better prices for honey if every thing else is to be high, so we bee-keepers may have a fair show in the fight for a livelihood. I am of the opinion that a lot of bee-keepers are to blame. Many others do not read bee journals or market quotations, and sell in ignorance of the value of their product. If honey were even a cent higher it would do a lot of good. It is impossible to make any thing putting up honey in tumblers when it is sold by jobbers here at 85 cts. per doz.

THE COVER DESIGN; BEE-KEEPERS OF ANCIENT GREECE.

WE do not know when the Greeks became bee-keepers; yet at a period of time when many other great nations were yet unborn we find these classic people engaged in honey production. They seem to have produced vast quantities of this delicious food, for the poets and historians are very profuse in their praises of the industry. This alone is proof that the bee-keeper was a factor worthy of attention. The fame of the honey of Mt. Hymettus reached from the Pillars of Hercules to Colchis.

The drawing shows a Greek bee-keeper of the "Macedonian Supremacy" period paying a forced tribute of honey to the tax collector. The hives shown are not of straw, as they appear to be, but are made of woven splints of wood, much after the fashion of the hickory corn-baskets of our fathers. The bees of Greece were quite likely of the yellow variety.

THE ALEXANDER METHOD OF CURING FOUL BROOD (BLACK BROOD).

MORE evidence is still coming in, showing that there is undoubtedly some merit, at least, in the Alexander cure. One letter, especially, comes from the author of the McEvoy treatment, and we are glad to place this before our readers:

> *Mr. E. R. Root:*—Dr. C. C. Miller did well in curing his apiary of disease in an off year and in a very trying time. He has few equals as a practical bee-keeper. I am much pleased over his success, *as it confirms almost all I have ever claimed.* I felt like going over the doctor's article and writing a few lines which would be in his favor; but as others will, no doubt, take a hand, I will leave it to them.
>
> We are having a fine winter so far—ground all covered with snow enough to save clover if it remains long enough. WM. MCEVOY.
>
> Woodburn, Ontario, Can.

Italics ours. As this letter came unsolicited, and from one of the best authorities on brood diseases in the world, it doubtless will have some weight. We are anxious to gather in all the testimony both for and against the Alexander treatment, and we hope to hear from others, including, of course, Mr. McEvoy.

THE CENSUS OF AGRICULTURE TO BE TAKEN THIS YEAR; THE UNRELIABILITY OF FORMER CENSUS FIGURES AS THEY RELATE TO BEE CULTURE; SOME DIFFICULTIES FOR 1909.

ACCORDING to the usual practice of a decennial census, the thirteenth census of the United States will be made this year. The agricultural census, which will form part of this general census, will be taken between April 15 and May 1, and the enumeration will be as of April 15. The reports on crops will be for the year 1909. The bee-keepers of the country will be interested in this census, for this is almost the only means which we have at present of learning the extent of the industry or what its growth has been.

We can supplement census data somewhat by general impressions and careful estimates; but, unfortunately, census figures in the past have not been very satisfactory. For example, the census of 1900 gave the total hon-

ey production for 1899 as 61,196,160 pounds —a figure so low that the annual comb-honey crop alone would probably exceed it. Unfortunately, only those apiaries on farms were included in the enumeration, and it is, of course, obvious that a very large percentage of apiaries, especially in the East, are not on farms but on smaller tracts of land in towns and cities. A farm in the census is defined as at least four acres, or enough to support the owner. It is to be hoped that bee-keeping will be included in the enumeration in towns and cities in the next census.

It is most unfortunate that the honey crop of 1909 has been a complete failure in so many localities. This will make the recorded figures of little value as representing the industry as it normally exists, or as indicating the value of the honey-bee as a producer. The enumeration of the number of colonies on April 15 will give the least number possible for the winter losses, which are heavy when we consider all classes of bee-keepers, will have been completed, and there will by that time have been no increase for 1910 except in the South. It will be obviously unfair to estimate the average production per colony by comparing the crop of 1909 with the spring count of 1910 except in a very general way.

Bee-keepers should make it a point to see to it that their bees are included when the enumerators visit them so that we can make as good a showing as possible. It may also be well for us in giving the crop for 1909 to designate honey-dew honey separately so as to attract the attention of the census authorities to the abnormalities of the year 1909.

SOME INTERESTING WINTER READING.

A YEAR ago we published a portion of a contribution on the natural history of the honey-bee, by Dr. H. von Buttel-Reepen. This was entitled, "Are Bees Reflex Machines?" but the very nature of the title was such as to cause our readers to believe that it was an abstruse scientific work beyond their comprehension. As a natural consequence, these papers did not at the time attract any considerable attention. Dr. von Buttel-Reepen, while a scientific man, is also a practical bee-keeper. He conducted a series of experiments that are not only exceedingly interesting but valuable from a practical standpoint. During the long winter evenings it is our opinion that many of our practical honey-producers will find this to be exceedingly profitable reading-matter.

Here is a list of the titles and subheads:

THE HIVE ODOR AND ITS REACTIONS.
- Modification of Reactions toward the Hive Odor.
- The Swarming-out of a Queenless Colony.
- Intensifying the Reaction.
- Overcoming the Reactions toward Hive Odor.
- The Odor of the Queen.
- The Brood Odor.
- The Indifferent Odor of Young Bees.
- Failure of the Hive-odor Reactions in Queens and Drones.
- Abnormal Hive Odor.

THE MEANS OF COMMUNICATION IN BEES.
- Investigations with Colonies from which the Queens are Taken.
- Behavior of a Queenless Swarm.
- Disregard of a Queen in Open Air.
- Hearing Capacity and Sensations of Sound Present.
- Experiments on Swarms.
- The Infecting Influence of the Swarm-tone.
- The Enticing Note of Bees.
- The Teeting and Quahking of a Queen.
- The Queen's Tone of Fear.

MEMORY OF PLACE IN BEES.
- The Paths of Bees and their Direction.
- Disappearance of the Memory for Location through Narcotization.
- The Box Experiment.
- The Loss of Memory for Location through Swarm Dizziness.
- Associations of Impressions.
- Memory for the Feeding-place in the Hive.
- Conduct of Bees in the Buckwheat Season.
- Are Bees Attracted by the Color of Flowers or by the Nectar?
- Place Perception in the Queen.
- Memory for Locality in Scouting Bees.
- The Eyes of Bees.
- The Flight of Orientation.
- The Finding of the Hive through the Senses of Sight and Smell.
- Bethe's Tree Experiment.
- Special Capacity for Orientation in Bees.
- The Influence of Weather Conditions on the Sense of Sight, therefore on the Ability to Orient.
- Influence of Color on Bees.

FURTHER CONTRIBUTIONS TO THE NATURAL HISTORY.
- The Flight of Bees into a Room.
- The Behavior of Robbing Bees.
- The Origin of Hostile Conduct.
- The Vanishing of Instincts with the Decrease in the Strength of a Colony.
- Reactions toward Flight.
- The Formation of the Honey-comb.
- The Play Instinct in Bees.
- Bibliography.

The work was originally written in German, but was recently revised and afterward translated into English by one who has not only a knowledge of bees but of scientific terms. While this work really cost us more than any other of equal size, we are going to offer it to our readers on conditions that will place it within easy reach. It has 50 pages the size of this; and to any one of our subscribers who will send us $1.00 before his subscription expires, or, if the subscription has expired, will pay up all back arrearages and $1.00 for one year in advance, we will send a copy of this work postpaid. The general current of the discussion that will be running during the year 1910 in these pages will make this contribution exceedingly helpful.

ECHOES FROM THE LAST CONVENTION OF THE NATIONAL BEE-KEEPERS' ASSOCIATION AT SIOUX CITY.

THE last Annual Report of the National Association, giving a financial statement, complete list of the membership, and report of the proceedings, has been issued. Among other things discussed was the question of fastening foundation in brood-frames and the various methods of staying it by means of wire or splints. In this connection Mr. O. O. Poppleton drew attention to a method that he had been using with considerable success, that employed neither wire nor splints. Mr. Poppleton said:

Some six or eight years ago a gentleman in California sent me a permit to use his patent, and it is the finest I have ever used; but on account of its being patented I have never given it out very much. Mr. Hill, the late editor of the *American Bee-keeper*, in Florida,

and myself tried to retain the patent for the purpose of giving it to the bee-keeping world, but we could not succeed, and we dropped the thing. We use it ourselves. It beats wiring. I have not used wire for years. It is a very simple thing indeed. I have now in use something very similar to the old Given press. I had one in the apiary when I went to Cuba, and in using that I would make a double dip of the top of each sheet—that is, dip sidewise instead of endwise, and by doing it that way and pressing it I got sheets that would not stretch, having the upper half very heavy and the lower half very thin. I tried to interest the Roots, but they said there was some mechanical difficulty in running foundation by that method. Then I tried again a few years ago to interest them, but they were then working on another scheme, and did not take it up. This process is simply forcing the wax to any part of the section that you want it by brushing melted wax over the surface. It also adds wax to the edges of the cells, and in some way or other strengthens them. I think that also solves the question of feeding wax to the bees for them to use. I take my comb, and I have a little dish over a small kerosene-stove so as to keep the wax melted. I use an ordinary three-inch flat varnish-brush. I take up all the wax I can, and just rub it over the upper half until that wax will press out over the edges of the cells. It adds wax to the cells in the upper part, and I have no trouble. I use a quarter-inch-deep foundation. I have the finest combs I have ever had in my life. It solves the entire problem of stretching combs. The gentleman who has patented this process lives in Southern California, and his name is Henry Vogeler. It was patented in 1900. I would no more think of going back to wires or doing without it than I would of trying to keep bees that would not rob.

A patent was issued to Mr. Henry Vogeler, New Castle, Pa., April 17, 1900. The specific claim covering the process reads as follows:

"As an improved article of manufacture, the artificial comb foundation having its cells constructed with thick beads extending around and constituting their rims or edges, as and for the purpose specified."

Any person who desires to use this process should make arrangements with Mr. Vogeler.

RENDERING COMBS INTO WAX.

On this subject Mr. C. P. Dadant, who, as everybody knows, is an authority on the subject, had this to say:

Beeswax can be overheated with water by overboiling. The water, in boiling through the beeswax, will beat it into a grainy substance which looks like pulp. You can change your cakes into powder from one end to the other by overboiling—by allowing the water to beat your wax into a grainy mass. If you have seen something like corn meal at the bottom of your cakes it is beeswax; and the only way in which you can return that is by dry melting. There are several things about the rendering of combs that are of some importance to know. Do not melt your beeswax with water in pans that contain any iron. Iron will turn your wax black. There are several little points that should be considered. Do not use any acids in rendering wax. Most people, when they do use acid, use twenty times as much as they need. It takes the smell of the bees out of the beeswax. Our friend Mr. Kretchmer said, "Soak your combs a long time." That is right. Take the old cocoons and crush them as much as you can, so that they will not take in the beeswax. Those cocoons have the shape of a honey-cell, and they remain there after they are crushed, and there is no chance for the beeswax to get into them. Put your combs in clean water and melt them. It is not necessary to use a press until you have taken the best of your wax out. We never do use a press with cappings, but we use a press for the residue. A gentleman asked me a question. The boiling must be with water; and if you spoil the beeswax and get it grainy, that part which is grainy, and which is more or less dirty, and which contains a good deal of water, must be returned to good shape by dry heat. Then you will not have as good beeswax as you would otherwise have. I have had shipments of beeswax that were so badly beaten with water that they would lose one-fifth. It would not look very much like beeswax. It would look like a cake made of ground corn. I had a long discussion in regard to pollen in beeswax. I did not know at first that there was any such thing; but I found it out when we were making foundation. We were throwing away our residue containing that grainy substance. In the course of time it melted in the sun, and after a while we took up this residue and got 100 lbs. of beeswax from it.

USING HONEY AGAIN FROM FOUL-BROODY HIVES, EVEN AFTER IT HAS BEEN BOILED.

On this subject Mr. N. E. France, General Manager of the National Bee-keepers' Association, and official foul-brood inspector for Wisconsin, has some decided ideas.

Mr. President, the care of honey from infected hives has been one of the greatest hobbies of my work in our State. About five or six weeks ago I received notice that a whole apiary was to be moved from Wisconsin to Iowa, and that there was infection in that yard. I was not aware of it. I went there and found infection; and in order to hold the man I put a printed quarantine card upon the yard, and said, "You dare not move one thing. It must be treated right here." But he said, "I am away from home on expense, and I can not afford to stay." I replied, "Sir, if you were sick with the smallpox you would stay. This is not smallpox, but to the bees it is equal to it."

He had four colonies of bees all ready for shipment, but they never left the city. The honey was extracted from those combs with the understanding that it should all be used as a food consumption in two families who knew what they were using, and that the dishes or cans in which it came were at my mercy, and they were disposed of. Infected honey, I have not been able to say positively, is injurious to human health, but I can not for one moment recommend it. I have used some of that honey purposely from some badly infected combs myself, and I fancy I have received some ill effects temporarily. One man in one county extracted honey where the brown ropy matter was in some combs, and went into the honey visible to the naked eye, and that honey he himself used, and his family, and he is still living and in good health. To go back to the point of what we were going to allow with regard to this honey, in two cases where they had considerable of it I allowed them to ship it to bakers, marking the barrels and notifying them that it was infected honey, and that those barrels must be burned. Otherwise I have not allowed any one, where I have known of infected honey in the State, to do any thing with that honey but either to destroy it totally or boil it, after which it is not of any value; because if you boil it enough you have blackened your honey till there is no commercial value in it.

Mr. Ramer.—Would it do to feed to the bees again after boiling?

Mr. France.—Don't take the chance. I believe it is possible that that honey can be boiled and used again, from the fact that I made a desperate effort twelve years ago to save every thing in a yard of over 200 infected colonies. We took the hives, cleansed them, and put the bees back into the same hives, extracted and boiled the honey, and, having a foundation outfit on the farm, we made some infected wax into comb foundation, put the bees on to that, and fed them with boiled infected honey. That was twelve years ago, and no disease has shown up since; but I would not want that to become a general public statement, from the fact that any one else might not be as thorough. We boiled that honey to a finish. I have seen honey that has been called boiled in which the germs of the disease were plentiful and alive. There have been in my State and in adjoining ones, not giving names, nine instances where honey from an unknown source has been used as a means of feeding bees for winter stores, and in those cases it has brought the disease to their yards. Do not for one moment buy honey to feed to your bees unless you know positively the source it comes from. Sugar syrup is better than to take those chances.

Dr. Bohrer.—I have some at home canned up, but I will not sell it. I am too good a Christian to sell it. I would as soon go into my neighbor's barn and steal his horses. As to extracting it, when it reaches the stage Mr. France has spoken of, that is, with a large number of diseased larvæ, and decomposed and ropy, I never extracted any honey from a frame of that kind. I simply take the frames that have no brood in them and extract the honey from them. If I use that at all, I use it on my own table in the winter time. Where Mr. Poppleton lives he had better not use it at all, because he lives in a warmer climate and bees get out every day in the year, and they may get at that honey. You must not take any chances. If you can not use it during the cold winter weather it is better to dig a hole and bury it.

STRAY STRAWS

BY DR. C. C. MILLER, MARENGO, ILL.

THAT 15-INCH snow-blanket has had another 15 inches added in this locality.

LIGHT-BROOD foundation with 7 splints works all right here.

"WE DO NOT BELIEVE cold actually kills bees," p. 35. No, no more than it does people. But it may kill either bees or people.

IN THE *Canadian Bee Journal*, page 424, J. E. Hand reports successful wintering on solid slabs of honey with two inches between the combs.

H. E. CROWTHER had no buckling with 5-inch splints, and I had. He gives the reason, p. 22. He used horizontal wires and I used none.

LOUIS SCHOLL, you're a goose. There you go, p. 39, trying to get those Colorado fellows to run for bulk honey; and then when they flood your market with it where will you be?

TO EXCLUDE the queen from upper stories, J. C. Clayton, in the first story over the brood-chamber, spaces extracting-combs two inches. He says the queen will not pass up hrough this.—*British B. J.*, 474.

A PLANT-LOUSE, in five hours, secretes an mount of honey-dew equal to the bulk of its own body. A linden-tree with 24,000 leaves can furnish 50 pounds of honey-dew.—*Deutsche Imker aus Boehmen*, 406.

I THINK it has been suggested that bees cluster front with honey further back because the honey is thus safer from robbers. Is it not just possible, also, that the brood-nest is near the entrance for the sake of the fresher air there. [That has always been our theory.—ED.]

C. G. HULICK, p. 43, if moisture here would use up an unpainted hive in two years, as it does yours, I think I'd paint. But when it lasts 25 years, I'd rather have the advantages of no paint. The chief one is that the moisture from the bees' breath dries out more quickly in an unpainted hive.

I HAVE A NOTION (but I don't know) that solid frames of honey with a two-inch space beneath will be all right for outdoor wintering. But the bees will at once proceed to make your sort of brood-nest, Mr. Editor. [They may make that nest, but the cold slabs of honey in the mean time may give them a set back.—ED.]

G. M. DOOLITTLE, I always supposed that, in all normal superseding, queen-cells were started before the death of the queen; and until your statement, p. 759, I never knew that blacks used post-constructed cells for superseding—never saw it in print before. But I can't understand why a queen from a larva a day or two old isn't just as good as one from an egg laid in a queen-cell.

D. M. MACDONALD, *British B. J.*, 469, quoting American approval of sweet clover, says: "I have frequently intended asking if any one in this country grows *sweet* clover. . . I wish I had some seed!" Is it possible that there is a spot in Scotland where the plant is not known, either under the name melilot, Bokhara, or sweet clover? If so, my Scotch brother, let me know, and I'll send you some seed.

GERMAN bee journals are talking about the discovery of Dr. Kuestenmacher that honey contains more albumen than has heretofore been credited to it, in a form more readily assimilable than in any other albuminous food, making it specially valuable from a medicinal standpoint, and making it thus possible to distinguish chemically between pure and adulterated honey.

THE GERMAN EMPIRE, according to the census of Dec. 2, 1907, now made public, averages 19.2 colonies of bees to the square mile, ranging from 9.58 to 44. *Deutsche Bienenzucht*, 184, in giving these figures, says the difference is not so much due to difference in pasturage as to the advancement of bee culture in the different parts. If we plant the apiaries three miles apart there will be from 86 to 396 colonies in each apiary, averaging 172. As pasturage is supposed to be better here than in Germany, it looks as if E. W. Alexander was right as to our being too easily scared about overstocking. Or does their overstocking account for their poorer yields?

C. F. BENDER says, p. 43, "But I think it is perfectly safe to keep them in pairs, as I never knew bees to mistake right and left." I'm afraid the importance of that statement is not generally understood as it should be; and Mr. Bender gives a striking proof of its correctness. Suppose you have a straight row of hives 8 feet apart in the row. Now replace each single hive with a pair, and there will be no more mistakes about entering wrong hives than when the hives stood single. The bees of No. 7 may make the mistake of entering No. 5 or No. 9, but they will never enter No. 8, the other hive of the pair. You see that, by putting hives in pairs, you double the number on the same ground without at all increasing the danger of entering wrong hives.

THE TWO WAYS I treated black brood are run together as one, p. 45, and the mistake is made of giving combs instead of empty frames. The pith of the shaking treatment is this: Brush, and leave in the hive one foul comb and two empty *frames* (no starters); when comb and eggs appear in empty frames, remove foul comb and fill up with foundation. The improved Alexander treatment runs thus: Unqueen; ten days later destroy cells and give a virgin. That's all. But please remember this is not for American foul brood. [It remains to be seen whether colonies given this treatment will stay cured next year, and the year after that. There are some who say European foul brood (black brood) can be cured this way for one season, but that it may come back the year following. Keep a sharp eye on these colonies next season and report.—ED.]

BEE-KEEPING AMONG THE ROCKIES.

By Wesley Foster, Boulder, Col.

SAGGING OF SECTION-HOLDERS.

When a super gets full of honey the section-holders sag in the middle and destroy the correct bee-space above and below, and also throw some of the sections out of shape. A section-holder slat should be ⅜ in. instead of ¼ to overcome this fault. I have seen the holders sagging nearly the full bee-space, and resting on the tops of the frames.

A HARD WINTER.

On Thanksgiving day the weather changed from the usual Colorado fall, of perfect days, to regular severe cold of the Eastern State variety, with no warm weather up to this time, except for a few days about Christmas, when the bees had a cleansing flight. Few stores have been consumed, and the dead bees have not shown up much on the bottom-boards. On the whole I think outdoor-wintered bees are doing just as well as the most hopeful could expect. The prolonged cold may tell on the vitality of the colonies later on, but we are not grieving yet. Hot cakes and biscuits are being eaten these cold snappy days, and I can see where last year's crop is fast passing to the "ultimate consumer." The glucose people seem to profit also by the hot-cake weather, and no wonder; for a gallon of corn syrup costs but fifty cents, while honey is a dollar and a half. Many do not object to poor food if they can get it cheaper. What we bee-keepers must do is to educate the public to use the best and purest foods.

Comb honey still unsold which has commenced to granulate is the most serious difficulty to be met in the rapid spread of honey consumption; so all cases should be gone over, and the slightly candied combs removed. This can be melted down, or sold to those who like the candied article.

THE RANGE OF FLIGHT VARIES.

This question of the distance bees fly for honey depends much on differing conditions, topography of the range, direction the prevailing wind blows, fragrance and abundance of the honey flora, position and facing of the bee-yard. All these factors enter in quite largely before one can say when a location is worth any thing or is already overstocked.

First, taking up the topography of the district over which the bees have to forage. An apiary which we bought was located in a sort of hole. Dry hills rose on each side; and, though the distance to a good number of alfalfa fields was not far, those bees did only about half as well as some which were only three-quarters of a mile distant. I can come to no conlcusion but that those bees could not see, smell, or hear of the blossoming fields till too late to do really good work. The odds were too much for the bees to combat in some particulars. Whether I have offered the real solution I can not say; but the fact remains that bees but a short distance away gathered a good surplus.

As to the wind affecting the direction bees fly, I think this would apply only where the wind is very constant, making it almost impossible for flight in other directions. One would think bees could see that, if they fly against the wind, the wind will be at their backs on the home stretch; but if the wind continually blows them back, making access to the desirable fields difficult, they are not likely to persist against the odds.

One reason the sweet clover is visited by the bees so plentifully is that it is so much more pronounced in odor than alfalfa. I would not admit that sweet clover is more fragrant, but it has more odor.

As to bees guiding their flight according to the way they get started from the apiary, I think this depends very largely on the abundance of nectar in the flowers straight ahead. If a long dense grove of trees cuts off sight and flight to the west while there is an abundance of virgin territory to the east it is reasonable to suppose that very little work will be done through that grove barrier till the district to the east begins to fail.

THE ANSWER TO CROWTHER'S PROBLEM; THE DISTANCE OF A GOOD WATER SUPPLY.

Giving my ideas on Mr. Crowther's problem, page 22, Jan. 1, I will say that I think the bees located three-quarters of a mile above the irrigation canal were so far removed from the good honey acreage that much energy was wasted in gathering a surplus. Bees do not fly at all profitably for honey more than a mile and a half, and that three-fourths mile of barren ground discouraged the more timid bees, if there were such, and I do not see why we can not say this, for some bees are out in the morning as soon as the sun rises, while the large majority do not start to work till encouraged by the successful efforts of the early ones.

The distance from a good water supply would account for some of this difference in yield. I do not imagine that a great barren plain looks very inviting to the bees, for it is their nature to live among trees and grass and flowers. I wonder how many of the readers know the lost and lonesome feeling that comes from being alone on a level stretch of buffalo grass and sand. The only thing bearable is knowing the distance to water, grass, and civilization. But suppose one were a bee, and did not know whether there was any thing green on earth; then he would feel like curling up in a ball and giving up this world as a great mistake. I imagine that bees placed out a mile from any irrigated land feel like doing this very thing.

Whether bees will fly seven miles down from the mountains to the valley and gather alfalfa honey, I must say that I think the territory nearer home should be scrutinized very carefully before placing a great deal of confidence in the seven-mile flight.

NOTES FROM CANADA

By R. F. HOLTERMANN.

FOUL-BROOD ILLUSTRATED.

The Department of Agriculture for Ontario has ordered from Germany 5000 copies of a lithograph of a foul-broody comb which was published by the *Leipziger Bienen Zeitung* some time ago. It is an excellent illustration, and it will be a great educator as to the appearance of foul brood in the comb.

POISONOUS COMB HONEY.

On page 21, Jan. 1, Geo. M. Lord relates an experience in connection with some comb honey taken from the eaves of a neighbor's house, which gave cramps and nausea. I have heard of honey taken from a bee-tree having this effect when bees had been crushed between the comb, causing them to sting the comb and inject poison into the honey.

THE TIME WHEN BASSWOOD BLOSSOMS.

G. M. Doolittle, page 1910, draws attention to the great variation in the time of blossoming of basswoods. Some always blossom early, while others are always late. I have frequently noticed this. I am, however, also of the opinion that two localities 100 miles apart may make a difference of ten to twelve days in the time of blossoming. I have such a case in mind now.

THE MUSIC OF BEES.

When I read on page 29, Jan. 1, the statement of P. W. Richards, to the effect that he, having a musical training, can tell by the pitch of the note the bees make whether the queen is there, and if so in what part of the hive, I felt like placing the following notice in GLEANINGS:

"Wanted, an expert musician who also wants to learn bee-keeping, we to exchange knowledge."

But I do believe this is possible, and I believe F. J. Miller, London, Ont., deserves great credit for being courageous enough to bring forward so new a thought.

THE FOLLY OF MIXED GRADING.

On page 555 Editor Root endorses the statement made by J. E. Crane, page 560. Both condemn making up a shipment where No. 1 and No. are mixed, or the dark honey is with light. There has been altogether too much of this done. If the purchaser has been foolish enough to pay for the goods in advance, and the seller is irresponsible financially, the purchaser is very cautious about purchasing *any* comb honey in future. If the seller has not been paid for his goods in advance he will want to deduct enough from the original price to cover all trouble, risk, and loss; and if he is as unscrupulous as the seller he will try to deduct a good deal more. There are good bee-keepers who can not find the highest market for their honey; but too many when they have a customer do not hold him, because the sample they sent is better than the goods produced, or the goods shipped are not equal to the description by word of mouth or letter.

J. L. BYER.

The readers will be pleased to have seen the Byer family group as shown on p. 779, Dec. 15. Mr. Byer comes of bee-keeping stock; the family is well and favorably known through a wide section of country, and it has been my pleasure to visit among them several times. Our friend is not only a good writer but a good speaker. When he speaks he does so with energy; and he, Sibbald, Miller, and several others would make excellent farmers'-institute speakers, which, in my estimation, are much needed in Ontario if the slipshod and disinterested bee-keeper, who will not go to a bee-convention or take a bee-paper, is to be reached.

ROBBER-TRAPS.

Referring again to robber-traps, I can not see how honest bees, that are active in their instincts, and ready to avail themselves of every opportunity to gather honey, can help being drawn into these traps. If there is any law in the life of the bee that discriminates between the honey which it is legitimate for her to gather and that which is not, I don't know of it. If I were buying bees I would give the preference, other things being equal, to the colony which would be the quickest to scent or find out the best source of honey, no matter what that source might be; and I doubt if there would be any distinction manifested as to quickness of discernment in stocks were the source blossoms or exposed honey, if the former source were not available. That being the case, it appears to me that, by setting out robber-traps, bees are punished for their activity, and other bees are drawn into the difficulty. As to Editor Root's remark, "If he [Holtermann] can get a new man who will let no robbing get started he is doing better than we can." Just let me tell you in confidence, friend Root, that, in robbing time, I take good care to be outside myself always, and watch with an eagle eye every thing that is being done; and I find it a very difficult task to impress even *men of experience* with the absolute importance, when working in the apiary in robbing time, of preventing the bees from getting a start.

I remember that Mr. Paul Mickwitz, of Finland, whom the readers of GLEANINGS know, lamented and longed for the experience of a good robbing time in the season that he spent with me. I said to him, "I shall take *mighty* good care that you don't have that experience at my expense," and he did not. He, however, had his wish gratified at another apiary in the district. Of course, I do not speak of special emergencies such as in a queen-rearing apiary. There are some things better than others; or perhaps, I had better say, worse than others, yet neither may be desirable. The article in the *British Bee Journal*, I judged, was intended for the average bee-keeper.

CONVERSATIONS WITH DOOLITTLE

AT BORODINO, NEW YORK.

WHEN SHOULD WE EXTRACT HONEY?

"Mr. Doolittle, I had thought of working mainly for extracted honey next season: but from what I have read, it is not at all plain when I should extract the honey from the combs. I find that most bee-keepers, those living in the northern and eastern part of the United States, advocate leaving the honey on the hives till it is all sealed over, some even saying it should be left on till the end of the season, or at least till the flow from clover or basswood is over; while those living in California and in the most of the Southern States claim that it is a waste in time and honey to leave the honey after the combs are half sealed over. Others advocate extracting when few or no cells are sealed, and then ripening the honey in tanks. Do you think locality plays an important part in this matter?"

"Undoubtedly locality does have something to do with this, for under certain conditions honey may be in excellent condition to extract when the combs are only partly sealed over; while under other conditions, and with certain kinds of honey, it would be much better if not extracted until the combs were fully sealed, and, better yet, if left on the hives from one to four weeks longer. These are points with which the expert is familiar, though often overlooked by the inexperienced. You can not go far out of the way by following the advice of such men as Hutchinson, Root, Coggshall, and others, who advocate leaving honey on the hives till the end of the flow from the nectar-plants which give what is termed 'white honey,' or till the end of the bloom of those flowers which give your main crop of white honey, if the mixing of the different white honeys hurts the flavor and sale of your product. Expert skill in handling extracted honey is not so important in the arid West, as I understand it, as it is in many other localities. Conditions there are naturally favorable to the caring for honey under almost all circumstances; not so, however, in this State and in many other places."

"But some of the writers claim that honey can not be left on the hives until sealed, without materially lessening the crop. They start extracting when the combs are sealed along the tops a little, and from that to the middle. This honey is then allowed to stand in tanks covered with canvas, and evaporated until it attains the proper consistency. It would take the bees from three to five days to complete the sealing of such combs, which time would be nearly or entirely wasted on account of there being little or no room in which to store honey while the remaining cells were being capped over. I remember one of these writers laid particular emphasis on these words, 'The honey can ripen just as well in the tank as in the hives, and the majority of the bees are not compelled to lie idle, or resort to the brood-combs, to find room to store their honey."

"But such a state of affairs is not necessary, even if such an assertion held good; for the extracted-honey producer sees that colonies have sufficient comb room for the storing of honey while the combs which are filled are being sealed over."

"But that would require a large investment for hives and combs that would not be needed by the frequent-extracting plan, as well as not giving as good returns at the end of the season. Another writer said that nearly or quite nine-tenths of all loss of weight caused by the curing of newly gathered honey in the hive occurs during the first twelve or fifteen hours after it is first deposited in the combs.' Now, if this is the truth I can see no reason for leaving the honey on the hives several days longer, thus limiting the storage capacity of the hive, just to allow the honey to lose the one-tenth of weight necessary to ripen it sufficiently for market. Why not extract it and allow the honey to ripen in the tank, thus giving the bees room to work without piling up hive after hive of combs till the end of the season, this requiring quite a large investment of capital, which, in my case, would have to be borrowed?"

"If it were proven that honey of a nice flavor, equal to that of honey which has been ripened on the hive and prepared by the bees for a month or more could be produced by the tank method, then your reasoning might be correct; but the honey which holds its customers year after year is not, as a rule, honey which is extracted unsealed. The extracting and sale of *unripe* honey is not to be defended, and will react against the one practicing it, for such a one will not be likely to sell this quality of honey twice to the same purchaser."

"I am far from advocating unripe honey; but if honey can be extracted before it is fully sealed over, and then ripened in a tank so that it will weigh not less than twelve pounds to the gallon, retaining at the same time that nice taste and flavor, why do you and others oppose it?"

"Very many have started out with just the same ideas; but, so far as I know, all who have really been anxious to improve the call for extracted honey are now leaving it with the bees till it is fully sealed over, and the most of our really practical extracted-honey producers leave it with the bees till there is danger of having two or more kinds of honey mixed."

"The extracting of partially sealed honey, and allowing it to ripen in a tank, while the bees are filling the combs again, is something which appeals to me strongly, and, if I thought I was scientific enough I should do so, for I am firm in the belief that the expert who uses this method, and thus increases his yield, is to be commended. I would not class him as an unscrupulous person, but a level-headed business man."

"And my advice would be, 'go slow.'"

GENERAL CORRESPONDENCE

ABSORBENTS VS. SEALED COVERS.

How Much Packing shall we Use? an Interesting Discussion of the Whole Problem of Outdoor Wintering.

BY LEON C. WHEELER.

Mr. Editor:—On page 786 you make the following statement in reply to a letter from Chas. G. Macklin:

"Our experience has been practically the same as yours." "We can not understand why any one should get better wintering results by the use of damp, wet, or (worse yet) frozen absorbents."

It appears to me, Bro. Root, that you are taking an unfair position here, for you assume something which, in my experience at least, is not a fact, and then from that assumption draw erroneous conclusions. Because unsuccessful outdoor winterers find their absorbent cushions damp or frozen it does not necessarily signify that the successful winterer must have those conditions simply because he uses one principle used by the unsuccessful man.

One thing must always be taken into consideration before deciding on any method regarding the handling of bees; and that is, that we are not dependent on one feature of the management alone, but that every condition and every requirement must be the same in all other parts of the hive to make the test complete.

This is none the less true in regard to a decision of the relative merits of the hermetically sealed hive or the one allowing free upward ventilation.

It would give me great pleasure, Bro. Root, to have you come and make an examination of my bees at any time this winter, and see if you can find any dampness in any of them; and there is not one hermetically sealed hive in the yard. You would probably find it to a certain extent in a few of them; and now let me describe the hives in which you would find it.

They are double-walled hives with a two-inch packing space, and with a cover only six to eight inches deep — not far from the dimensions of the Root chaff hive, I believe. If I were compelled to use that kind of hive in this climate I would go one step further than Bro. Root, and say it is impossible to winter out of doors successfully any way.

My father-in-law, who has kept bees nearly forty years, has always wintered principally in chaff hives, and is ranked to-day as one of the three most successful outdoor winterers in this State, and he has never used sealed covers on any of them; but he does not use standard chaff hives. The hive that he uses is made with sides four inches deeper than the inside hive, and a cover eight to twelve inches high—making a packing space above the bees of not less than twelve inches, and with an outside packing space of from four to six inches.

When he persuaded me to go into the bee business on a small scale six years ago he sent over a couple of these hives. These two colonies increased to six by fall, and the hives were built of the same style for the other four. Although it was my first experience with bees, every colony wintered perfectly with free upward ventilation.

The next year I bought and increased to 27 colonies; and as I had learned quite a lot from reading the bee journals I built some hives on the same plan as the Root hives, with a two-inch packing and shallow covers. Well, I saved the 12 colonies wintered in the old-style hive; and, if I remember rightly, about six out of the fifteen wintered in the new hive. Strange to say, I did not learn my lesson thoroughly that winter; but another winter tried with the sealed covers cooked me, for I lost nearly all of them wintered in those hives, and about half of those in the big hives. Notice, I used sealed covers this time. It is only fair to say, however, that some of them were starvation cases, although they had the usual amount of stores in the fall.

Last winter I packed these light packing hives in a second packing of straw with a roof overhead, and they all wintered, although they did not come out in as good condition as those in large hives.

My experience as a whole with the large hives is perfect wintering in every instance except the one winter when I used sealed covers. With the smaller hives I had imperfect wintering in every instance; but it was worse the winter I used sealed covers.

Now about those damp absorbent cushions. I have in some instances found them damp in those lightly packed hives, but never in the large hives. What makes the difference? Why, it's as simple as falling off a log. The moisture thrown off by the bees condenses on the cold sides of the hive, on the same principle that steam inside of a house condenses on the windows. Why doesn't it condense on the inside walls of the house as well as on the windows? Simply because the outside air hasn't the chance to act on the inside walls with sufficient force to make them cold enough.

Now, this same principle holds good in the bee-hive. The warmer the hive can be made, the less chance for moisture to condense in the hive. The heat from the cluster being that much closer confined, it will take care of that much more moisture. Again, a hive packed with only four or five inches overhead, and no air-space above the packing, allows too much of the heat to escape in this direction, while a hive admitting six or eight inches packing, and an air-space of about the same depth above the packing, retains the heat much better. The packing, being warm, does not condense the moisture, but allows it to pass through it into the air-space above, where it is taken care of without any detriment to the bees.

Only a few moments ago, since beginning this article (the date is January 3), I went out and examined several colonies, and found them all dry and warm.

I should like to see Bro. Root try a few colonies in the hives I have described, and see what the results would be in using free upward ventilation.

Barryton, Mich.

[It rather appears to us that your indictment is not so much against sealed covers as against a too small double-walled or chaff hive—that is, a hive with too narrow spaces between the walls. We have read your article very carefully, and note that you tried the sealed covers only one year with your large chaff hives, and came to the conclusion that they were a failure. You also state, further on, that your experience with sealed covers on the smaller chaff hives was not satisfactory. We will admit that you may be right for your locality when you pronounce in favor of a larger chaff hive with an opportunity for the moisture to pass up through the packing material unobstructed by any sealed cover beneath.

You are probably aware of the fact that the writer had active charge of our bees from the year 1878 on to about 1883. During that time we used the large two-story Root chaff hive. This had walls about 8 inches thick around the brood-nest, and permitted of packing material from 6 to 8 inches thick over the brood-nest, with free airspace of five or six inches on top. For about fifteen years we wintered our bees outdoors in this sort of chaff hive; and from your description we should infer that our hive was even larger than yours. During nearly all of the period mentioned we used absorbing cushions with no sealed cover, and wintered successfully, except the winter of 1881, when our loss was very heavy, as was also the loss of nearly all bee-keepers throughout the country. In the early 80's practically every one who wintered outdoors used absorbing cushions. Taking every thing into consideration, the writer feels that he has had as much or more experience with large hives and absorbing cushions as he has had with the smaller chaff hives and sealed covers. The records show that we have been just as successful with the latter as with the former. The large Root chaff hives cost nearly twice as much as the present chaff hives now in use. When we were using these big hives and absorbing cushions it was noticeable every spring that the cushions were more or less damp, the amount of dampness depending upon the strength of the colony in the spring. At that time it was our custom, on a warm day when the sun was shining, to lift the covers, remove the cushions, lay them on the ground, letting them dry out all day. Just before night we put them back in the hives again. This was a regular program every spring. If we did not dry out the cushions we were likely to find dysentery very shortly.

Later on we began trying the big chaff hives with absorbing cushions and sealed covers, half having the absorbing cushions and the other half sealed covers. The result for a number of winters left us in doubt. We kept on with our experiments, however, and about this time began using the smaller chaff hive—first with absorbing cushions, and later with sealed covers. The smaller hives with sealed covers gave unmistakably better results than those with absorbing cushions. We also came to the conclusion that the small chaff hives with sealed covers would winter the bees about as well as the large chaff hives with absorbing cushions. The initial cost of the former finally decided us to abandon the big hives altogether. For the last fifteen years we have been wintering outdoors in the small hives with sealed covers, and any one of our apiarists will certify that our wintering has been remarkably good.

You probably fail to take into consideration the difference in climate. It is probably much warmer with us, and it is not so necessary to have a large hive; but a chaff or double-walled hive is an expensive proposition at best. These enormous chaffs especially really add too much to the operating expense in a bee-yard. While it is undeniably true that they are better in a climate like yours, because of the added protection, it does not follow that they afford the cheapest way of wintering, all things considered. Our argument has been this: That if the smaller chaff hives in a given locality with sealed covers will not bring the bees through in good condition the bee-keeper for that locality had *better by all means* adopt cellar wintering. When a chaff or double-walled hive has to be so large, with a packing space of anywhere from 6 to 10 inches in order to winter successfully, it is cheaper to winter indoors. The fact that the majority of bee-keepers in your State, especially the northern sections, winter in cellars or clamps, rather goes to show that this advice is not far from right. From the standpoint of economy it would be cheaper to use single-walled hives and build a repository wholly under ground for sheltering them during the winter than to put that same yard in these monstrous chaff hives. Portland cement is coming down, cheaper and cheaper, and lumber is growing higher and higher.

Having said this much we are not going so far as to say that the sealed cover is better or worse than the upward ventilation and absorbing cushions for all localities. If any one has been successful in wintering with the latter we would advise him by all means to stick to it. We are using at Medina the two methods side by side. Just yesterday (Jan. 12) we went out into the bee-yard and found the colonies provided with upward ventilation and absorbents were wintering just as well as those with sealed covers; but the absorbents were damp, in some cases quite wet. We will admit that, if we were using the old Root Jumbo chaff hive, at this stage of the year the absorbents would be dry. It is only when we come toward spring that the dampness seems to show up.—ED.]

MOVING FOUR WAGONLOADS OF BEES BY TRACTION-ENGINE IN CANADA.

MIGRATORY BEE-KEEPING ON A LARGE SCALE.

A Brief Mention of Some of the Difficulties Encountered when Moving Four Wagon-Loads of Bees with a Traction Engine.

BY R. F. HOLTERMANN.

Migratory bee-keeping, moving bees to various pastures, is, in Europe, a much more common practice than in America. In Europe, so far as I know, the main object in moving bees—aside from moving as a result of changing owners—is to give the bees the advantage of the heather and buckwheat bloom. In the United States, in addition to the objects given above, some have in view moves north and south, for considerable distances, to prolong the honey season.

My first move to bee pastures was some thirteen years ago; and since that, almost every season I have moved sometimes to clover, sometimes to basswood, and sometimes to buckwheat. During these years I have moved many and many a wagonload of bees, many a carload, and also boatloads including a tug and scow, boats propelled by gasoline-engine power and by the wind. This season there has been added to my experience, as seen by the illustration in connection with this article, moving by means of a traction engine.

The most anxious moments of my bee-keeping experience have been spent in moving bees, and I have no doubt whatever that these have resulted in many a gray hair being added to my head. And let me say here, that, unless undertaken in a very small way so that the responsibility and labor are greatly lessened, the chief point to consider is whether the bee-keeper is rightly constituted to bring this work to a successful issue. If he is to surmount the obstacles which lie inevitably in the path from time to time, he must be willing to throw into the work the best his body and mind can produce for the time being. Unless on a small scale this work must, of necessity, be laid out considerably ahead of time, and must, therefore, be carried out regardless of weather and other conditions, at the time set. For instance, if four or five teams are ordered for a certain night (we always try in summer to move at night), farmers often have to make special preparations such as putting hay-racks with straw on their wagon, greasing wagons, shoeing the farm horses in preparation for a long and unaccustomed road trip, etc. These farmers and the bee-keeper perhaps can not readily communicate with one another. This makes it imperative that *all* go, rain or shine, hot or cold. If the trip is made by train or boat the same holds good with the added responsibility of having teams ordered at the other end of the trip. If by boat, owing to the danger of storms, the risk is even greater; and with the danger of having a sail boat, by reason of contrary winds or a calm, left on the water during the heat of the day with the sun to beat down into the boat, the risk is incalculable. Although I have come safely through every experience, the sail boat for transporting bees is a thing of the past with me. I have seen enough to feel its danger.

In the first carload of bees I shipped I lost forty colonies out of 340; since that, so far as I can recollect, I have lost none by this method of shipping. Thirty-six-foot cattle cars are used. To give the bees air I have used my own invention, a portico to the hive with the sides slightly projecting, and in these projections on the inner side a groove is cut into which a screen can be quickly slipped preventing egress on the part of the bees. The hive entrance is the full width of the hive with a depth of 1¼ inches, and the portico leaves 2½ inches between the screen and the front of the hive. All the ventilation the bees get during a move is through this screen. My experience would lead me to urge that the bees be frequently sprinkled with water when in transit—the colder the water the better. To spray water all over the hives and the car is also an advantage. The evaporation which follows lowers the temperature. We watch the bees, and when they run about in the portico like a drove of sheep, manifesting excitement, and with their tongues protruding through the screen, we know that there is danger.

In moving bees I avoid using hives where the brood-chambers consist of combs newly built, preference being given to combs wired and toughened by cocoons. If the brood-combs are not heavy with honey and brood, so much the better; but to this latter I pay no attention, simply taking conditions as they are.

During the past summer, having to move bees some forty miles I consulted with the owner of a traction engine, explaining to him that we should have both clay and sand road; and after his assertion that he could draw the load I decided to give the plan a trial.

Some 110 twelve-frame hives with one or two supers on each were loaded on four wagons with racks filled with straw. The engine had also a water-tank, and upon this tank a platform with 1500 lbs. of coal. The bees were loaded, after being interrupted by a thunderstorm which promised much, but let us off with only a slight shower.

About 10 P.M. we moved off at a pace of about 4½ miles an hour. Every one felt that matters were working very smoothly. The party consisted of Mr. Shurr, the engineer and owner, standing on the engine step at the right hand of the engraving—a man who showed himself a master hand at his work, as we did not have to uncouple our long train even once to turn corners. By his side is Mr. Shurr's assistant. With the bees were Walter Ebert, with whose father I had the bees; next, Louis Held; and on the last wagon, Charles Hatton, of Ohio, whom I had met at the National convention in Detroit, and who spent some time with me to gain greater experience in the production of extracted honey. He said he shone in a long

day's work, and he had his opportunity, as it proved.

Our splendid start did not let me forget that there might be danger ahead, as there had apparently been a heavy thunderstorm, and frequent long trips had given me experience as to variations in rainfall in a section of country; and I knew how slippery clay roads under certain conditions might be. I used to be an advocate of wide-tired wagons until one night, moving bees on slippery roads, we had such wheels on one wagon, the rest being narrow. I followed that wagon on foot for six miles until we passed the clay, and again and again the rear slewed around until at right angles to the road, with every prospect of upsetting unless the driver followed the movement with his horses and the front wheels. From that night to this day I have felt that the advocates of legislation to compel the use of wide tires did not know their business.

The clay roads became more sticky; and, before we knew it, two wagons were almost over a steep bank. With chains to the rack of the wagon, and to a fence post on the other side, we relieved the pressure on the slowly sinking wheel on the other side of the load. A portion of the bees had to be unloaded. Such situations caused delay; and after a time, owing to frequent stops, our water and fuel ran out. The former, owing to a long spell of dry weather, was difficult to get. However, we reached the gravel at last, and our spirits rose; and as we made good time these feelings gave vent through the steam-whistle, as, in the engineer's estimation, worthy objects of salutation were passed on the road.

We thought our difficulties had been surmounted as we passed, like a triumphal procession, through Port Dover. The summer tourists were snapshotting the procession from every direction, thinking, as one expressed it to me, such a scene did not often present itself to the photographer. But when we came to the sand we found it too loose for the engine-wheels to secure a purchase. Here the engineer had reckoned without his host. It would take too much time to describe the troubles we encountered—the broken cable (for each wagon drew from one cable, thus preventing the strain from the rear wagons having to be borne by the preceding), hunts for water for bees and engine, etc. We had a splendid band of workers who made the most of every situation and opportunity. At the most critical time Messrs. E. Trinder, President of the Norfolk Bee-keepers' Association, and Jas. Armstrong, foul-brood inspector for the district, came along.

Seeing the straits we were in, Mr. Trinder gave us wood and water, refusing any pay. Mrs. Trinder prepared food for the party on the same terms, and then the above-named gentleman went ahead and arranged to put the bees at a nearer point, where they were placed by an exhausted party almost twenty-four hours after they were loaded. We all made a solemn resolution never again to move bees; but within a few days I had another night trip moving bees over the same road by wagon, followed by the shipment of a carload, and then four wagonloads the following week.

Any one moving bees should weigh well the cost, lay well his plans, judge well the chances as to honey, and not only be alert as to every thing going on, but carry the responsibility of the work and set the pace for his help. This means that some will have to carry a load that they are not able to bear. Others may refuse to work so hard, and in this they may have a wisdom superior to the one who practices migratory bee-keeping.

Experience has taught me that every teamster should be continually watched until he has proven himself a careful, thoughtful, and capable man.

Brantford, Ont.

WHY BEES GNAW COMBS.

Wax is Needed, and Bees Gnaw the Comb to Get it; they Never Gnaw it Away for the Purpose of Building Drone Comb.

BY L. B. SMITH.

It is stated by some good authority that if bees are given full sheets of foundation, all worker-sized cells, their instinct and craving will be so great for drones and drone-sized cells that they will often gnaw down a portion of the foundation and rebuild it with drone comb. I have watched this closely for the past 25 years, and have yet to see a case where the bees gnawed down the foundation, and rebuilt it *at once* with drone comb. You will notice that I emphasize the words "at once," for I have many times known bees to gnaw away at least a third of all the combs in the brood-chamber, and later rebuild it with drone comb; but at the time the gnawing was done the bees had no thought of rearing drones or building drone comb. My experience is that this gnawing away of either combs or comb foundation is done at a time when no honey is being gathered; and the more prolific races of bees, such as the Cyprians, Syrians, Carniolans, etc, are much worse at this naughty act of gnawing their combs than are the native black bees or the Italians. I will try to explain further why this is so. Of course, if comb foundation is in any way defective or distasteful to the bees they will proceed at once to gnaw it down and rebuild with both worker and drone comb; but at the time this gnawing away of ready-built combs takes place they will as readily remove drone as worker combs—that is, provided the combs are alike as to age, etc.

The question may be asked why bees gnaw combs, any way. The most common cause is the need of wax. At a time when but little honey is being gathered, bees secrete little or no wax: if a colony has a good queen and plenty of stores, brood-rearing will continue more or less all along, and there is a

Fig. 1.—Scholl's wholesale method of disinfecting by scorching hives, supers, bottoms, covers, etc.

constant call or need for wax by the bees for capping the brood and mixing with propolis to chink up cracks with, etc. At such times bees will not draw on their stores sufficiently to secrete wax; so to supply this want or need for wax they will begin gnawing the combs near the bottom next to the entrance of their hives, and will continue this gnawing until brood-rearing ceases or until a honey-flow comes on; and the more prolific races of bees, as above mentioned, will rear more brood during a honey-dearth than either Italian or black bees, and so, of course, need more wax, and gnaw their combs worse. It makes no difference at such a time whether it is drone or worker comb—it will be gnawed just the same.

Then these combs will not be rebuilt again until a honey-flow comes on and the bees begin to get crowded for room, and, of course, at such times it is only natural for them to build drone or store comb. I doubt whether bees ever gnaw down either comb or comb foundation with the full purpose in view of rebuilding it with drone comb.

We all know that there are other causes for bees gnawing their combs, such as moldy moth-eaten combs, and combs where pollen has caked and hardened in the cells, etc.

Bees here in the South will swarm if well supplied with honey at the swarming season, whether new honey is coming in or not. I have known them to swarm when no honey whatever was being gathered. If hived on foundation at such times they will draw out a small patch in the center of a few sheets, and the queen will start laying in the cells drawn out. By this time the bees will have used up all the wax scales they secreted before they left the parent hive, and they at once start to gnaw the foundation to supply the wax to cap the brood with, etc., and, later, a honey-flow comes on, they become prosperous, and soon more room is needed, and they will build store or drone comb in the places where they had a short time before gnawed away the foundation. The apiarist concludes, when he examines his bees and sees this drone comb where he had put in full sheets of foundation a short time before, that the bees had gnawed down the foundation for the purpose of building this drone comb, when the truth was they had no thought of building comb of any kind when the gnawing was done.

Rescue, Tex.

WHOLESALE DISINFECTION OF FOUL-BROODY HIVES.

When this Can be Done Quickly and Cheaply there is No Excuse for Not Doing it.

BY LOUIS H. SCHOLL.

The controversy, both *pro* and *con*, on the question of disinfecting foul-broody hives, has been quite interesting to me; also the stand taken by different ones, the editor included. I want to try to put "the lid" on this matter. My experience in foul-brood work has given me a splendid opportunity to observe some of the things alluded to in many of the arguments. As some argue, it *may* not be absolutely necessary to disinfect hives, bottoms, covers, etc., from foul-broody bees; but as long as we can not put *is* in the place of *may* with absolute certainty, there is left the question whether it would not be best to disinfect our hives, etc.; and we would rather err on the safe side. If there is one chance in a hundred of the trouble reappearing when we do not disinfect, we run the risk of subjecting all our bees to the danger of destruction by this dreadful disease, and we can not afford it.

I have always been a firm believer in disinfecting not only the hive-bodies, but bottoms, covers, supers, frames, yes, and every thing that has come in contact with foul-broody colonies or used in an apiary of such. The result has been a thorough job, and the cleaning-up of the trouble entirely; whereas we know of cases where the disease has reappeared again and again in some apiaries where treatment was given by others who were not able to solve the problem as to why

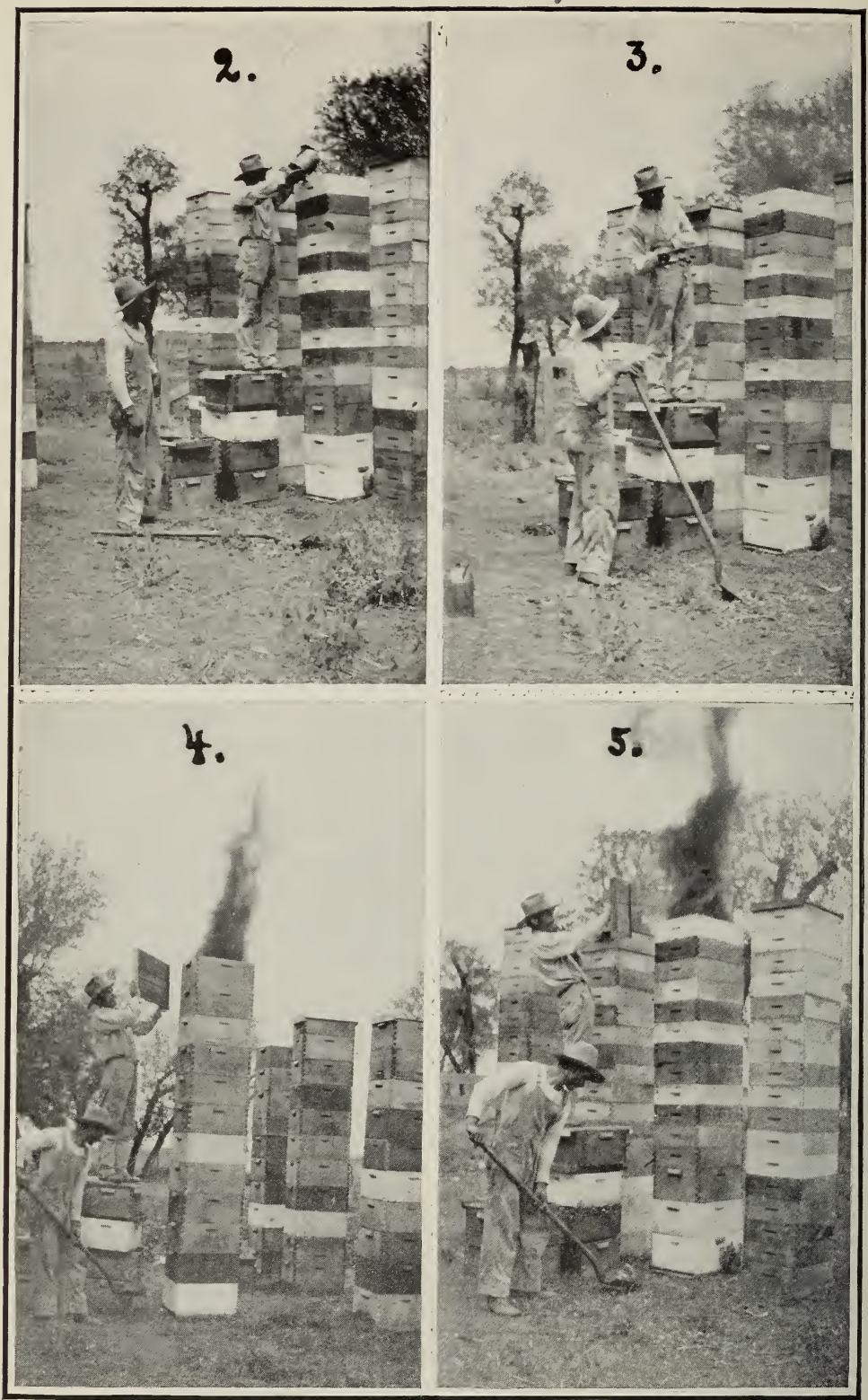


Fig. 2.—Wholesale disinfection of hive bodies and supers. Kerosene is poured down the stack of empty bodies. Fig. 3.—A lighted bunch of straw is thrown in which sets the whole thing on fire. Fig. 4.—In a moment all is a roaring furnace of flame. Fig. 5.—A spadeful of earth below at the draft-opening, and a cover on top finishes the job.

it should always crop out again. In these cases hive disinfection was not deemed at all necessary, and I venture to say that this is one reason why foul brood has to be treated over and over for years, many times in the same apiary. I have never been able to see why some of the small States that have had foul-brood inspectors for many years are not more free from the disease, unless it is that the disease reappears from some cause or other. And at least some cases can be traced back to non-disinfected hives, I feel almost sure.

Fig. 1 shows only one of several places where wholesale disinfecting was administered in my inspection work. All of the methods of disinfecting hives, etc, have been used more or less, but most of them are too slow. Instead of scorching out a single hive-body at a time we stack them up as in Fig. 2 to 5. The empty hives rest on a bottom-board which provides an entrance below to create a draft. A small quantity of coal oil is poured down the inside of the stack, as in Fig. 2. In Fig. 3 a bunch of straw, which was first set afire, is thrown in at the top, falls to the very bottom, and the fire runs up the streaks of oil. The draft upward soon makes all a roaring furnace of heat, which in a very few minutes would consume the entire pile of hives. A spadeful of loose earth to close the entrance instantly and cut off the draft, and a cover over the top as in Figs. 4 and 5, quenches the flames; but the heat remains intense for some little time, thus making splendid work of it. Those stacks in the pictures having covers on them have already been treated.

I used to think it was a waste of time to disinfect frames or save them at all; but experience has shown that it is expensive to destroy them. In Fig. 6 is shown a large vat over a quickly made trench in the ground in which a rather strong solution of lye and corrosive sublimate in water is heated. The frames, gathered together in lots, are immersed and thoroughly boiled for a short length of time. They come out as nice and clean as so many new frames.

In Fig. 8 the same solution is used in a large round tank which is heated by a steam jet from the upright boiler shown. In our work, all supers that may have been on foul-broody colonies are disinfected just the same. These are immersed with the frames in place, as shown in Fig. 8, a strong spring wire reaching over the top of the super holding them in place. The work is rapidly done in this wholesale way as effectively as in many of the methods that require too much time and trouble, and which, on this account, are too often neglected.

Now, since we can do this work so easily and rapidly and thoroughly, and since it is a risk not to do it, can we afford to say that it is not necessary to disinfect our hives etc.? I say, no.

New Braunfels, Texas.

ITALIANS SWARMED MORE THAN THE BLACKS.

BY W. C. MOLLETT.

Being convinced by what I had read in the bee journals and books of the superiority of Italians over the common black bees I bought queens of good Italian stock and requeened all except two or three of my colonies. This was two years ago, and I was very much pleased with the Italians on account of gen-

Fig. 6.—The frames are boiled in a large vat and made safe to use again.

Fig. 8.—Disinfecting covers and bottoms. The whole super with the inside fixtures and all is lowered into the vat of lye and corrosive sublimate, which is thoroughly heated by steam.

tleness and more pleasing color. They seemed to be of a more industrious disposition, and I had no doubt they would excel the blacks as honey-gatherers; but I was sadly deceived the first year. For some unaccountable reason they seemed possessed of the swarming fever, and swarmed from May till July, seeming to pay no attention to any thing but preparing to swarm. At the same time, the blacks were working steadily and laying up a surplus, and neither of the black colonies swarmed during the season. Two of them filled the supers twice, which is somewhat remarkable for this locality, for it does not have many honey-plants, and some seasons there is little or no honey secured. The Italians would hardly enter the supers at all; some colonies absolutely refused to work in the supers, and just swarmed out as soon as the lower story was full of bees, which would be in a very short time, as they seemed to be extraordinarily prolific. I know that the season has very much to do with swarming; but it seems reasonable to believe that both would have been equally affected. Most of what I have read on the subject says that the Italians are not excessive swarmers; but for some reason these certainly were, and they were said to be of excellent stock, being highly recommended by one of the largest honey-producers in the country. I am in hopes that the past was in some manner an abnormal season, and that the next will show better results.

WHITEWOOD AS A HONEY-PLANT.

This tree is usually called tulip-tree, or whitewood, in the North; but in the South it is almost always called "poplar." The wood is very valuable for building and a great many other purposes, and on this account the trees are becoming scarcer every year. Only a few years ago there were enormous quantities of these trees in most of the southern ranges of the Appalachian region and the foothills of the same region. Now there are only a few inaccessible places in which there are any considerable number of whitewood-trees, and these are growing scarcer year after year.

The whitewood blooms usually about the middle of May, and occasionally, when there are late frosts, the blossoms are almost all killed. This happened in the spring of 1907. There is almost always so much rain that the bees do not have a good chance to work on whitewood blooms. The blossoms are very large, and are almost exactly like a tulip-blossom, and contain a large amount of honey. The honey is of a dark color, but of very good quality, and brings as high a price here as any kind. I could easily sell thousands of pounds of it at a good price; but there is never enough of it to supply the demand. As the whitewood blooms early it is a great help in brood-rearing, and the bees build up very rapidly where there is even a small number of trees, and are in good shape for gathering basswood honey when the trees bloom. If there had been forest reservations established a few years ago the whitewood and basswood would have been very valuable sources of honey.

Stonecoal, W. Va.

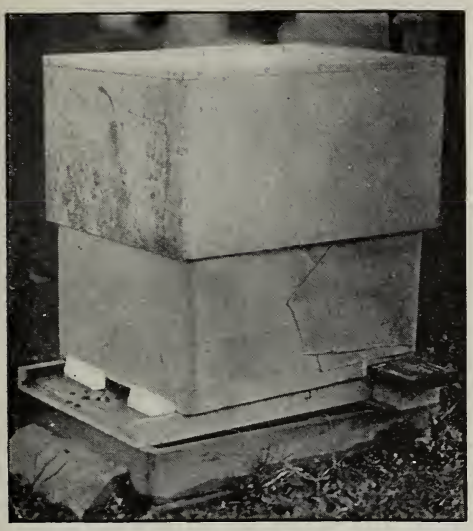
THE ALEXANDER CURE FOR FOUL BROOD.

Another Testimonial as to the Soundness of the Plan.

BY PERCY ORTON.

Dr. Miller's discovery, page 760, Dec. 15, in treating black brood, is ancient history to me, and should be to others if they had practiced what I wrote to you and was printed in GLEANINGS, April 15, 1906, page 507.

I knew how to rid combs of black brood long before Mr. E. W. Alexander reported it; but I was afraid of the State inspector, as two had been to my yard and told me to shake the bees on to new foundation and



Combination paper and wooden winter case being tried out at Medina.

melt up the combs, otherwise I should have reported before.

I have "discovered" that it is not necessary to kill, remove, or cage a queen when getting rid of black brood if you do not care to increase the number of brood-combs.

My treatment is this: Take out one half of the brood-combs in a hive, and push up the follower to within a bee-space of the other combs that are left; put on this body, half full of combs, a queen-excluding honey-board, and on top of that another hive-body. Shake every bee off the combs (that were removed) in front of the lower hive-body, allowing them to run in; then put the frames in the empty top hive-body and put on the cover. Leave them for ten days; exchange the lower combs with the upper, brushing all bees into the lower hive-body again. Leave two days as before, and at the expiration of that time put all the frames together below.

Nine times out of ten the colony will be cured if the bees are fairly strong in numbers.

If you are an extracted-honey producer it is much easier to rid the yard of black brood than if you are a comb-honey producer. The former has only to brush his bees on to extracting-frames, that have been on the hive to be treated, over a zinc five days or more, according to the time of year, and nineteen times out of twenty the colony will be cured the first time; if not, keep alternating the combs until they are. I never had to change more than twice, even in the worst cases.

I noticed at our bee-keepers' meeting held at Amsterdam that not one person ever took any stock in Mr. Alexander's cure for black brood. Any way, I never heard any one express himself favorably; *but it is a cure just the same.* The secret of it is to keep the queen away from the combs from 10 to 27 days. Some cases are different, and the worker bees will make the cure by removing the cause. Don't kill good queens. Don't shake bees on to foundation alone, as over half will swarm out.

Don't get discouraged. I have had lots of experience during the last seven years; but black brood doesn't bother me any more.

Northampton, N Y.

[See editorial comments elsewhere. It will be noted that Mr. Orton lives in a black-brood district, or what was once that, at least, in the State of New York.—ED.]

WINTERING OUTDOORS IN WINTER PAPER CASES.

BY E. R. ROOT.

Every winter we are conducting some experiments to test various methods of wintering outdoors. Ever since the winter paper cases came up for discussion we have been using them in a small way to determine how nearly they would hold their own with the regular standard double-walled chaff-packed hives. Experiments thus far conducted seem to show that the paper cases do not give as good results as the regular standard

Paper winter case with chaff cushion placed on top.

A paper winter case showing the folds of newspaper next to the hive.

hives. While they are, of course, far better than no protection whatever, it is doubtful whether, in our locality, it pays to fuss with any thing of this sort; for the loss in bees, and the greater consumption of stores, will more than make up for the cost of better protection.

During the last year or two we have been trying a combination of wooden winter case and the paper case. The subjoined illustrations will show how some of our hives are prepared. The inner cover is sealed down by the bees. Over the hive are placed several folds of newspaper; over this a large square of heavy wrapping paper, when the sides and ends are neatly folded down and tacked. An ordinary chaff cushion is placed on top, and over the whole is put a wooden winter case that neatly fits over. In the illustrations you will notice how the entrance has been reduced, and the further fact that an Alexander feeder is left on over winter.

We do not anticipate that this combination of wood and paper case will be as economical of stores and of bees as the regulation double-walled hive. Then why do we fuss with any arrangement of this kind? Simply that we may do a little experimenting for the readers of GLEANINGS. If they have any merit at all they may be useful in milder climates than we have here.

CARPENTRY FOR BEE-KEEPERS.

Sharpening a Saw.

BY F. DUNDAS TODD.

Here is part of a letter that got me into this trouble. When I had read as far as the middle of it I thought of that joke we used to rattle off as school-children: "Of all the saws I ever saw saw, this saw is the worst to saw I ever saw," or words to that effect.

There is one feature pertaining to carpentry regarding which a great lack of knowledge exists, and that is saw-sharpening. Can you not give us a chapter on this kind of work? The average farm-saw requires from 50 to 100 pounds weight on it to cause it to "chaw" through a soft-pine board. It is in the interest of the average boy that I want to see an article on how to file a saw.

One of my old business friends has a saying, "When the other fellow puts it up to me I always go him one better," and here it was squarely up to me. I have a perfect mania for very sharp tools, and for years I have taken care of all of them excepting the saws; and these, as soon as the keen edge was worn off, ordinarily by the boys trying to cut through a nail or two, I used to take to an expert. In a general kind of way I fancied all other users of saws did the same thing, even farmers. But I see I have been mistaken. Now that I come to think of it, I can not recall ever having seen a really sharp saw in a friend's house excepting one, and, strange to say, the owner of it was a bank official who sharpened it himself; but I can recall many blunt ones. Now that the problem was up to me I decided to learn how to sharpen a saw, even if it took a week, and included the destruction of one of Disston's best. Well, it took just one day to make me wise; and the best proof is that I have submitted to the critical examination of an old-time carpenter a rip, crosscut, and backsaw, all of which have been under my file, and he pronounces them well done; but he cautiously added, "Not perfect, remember." Being fresh from the work I feel I am in fine shape to tell how it was done, perhaps better than the expert, for he just forgets some little trifling point that means so much to the novice.

My correspondent wants especially to know how to treat a saw that has been filed out of order. Honestly, I did not expect to be able to handle this problem with credit; but my first attempt, just because of the want of information regarding a trivial point, resulted in a saw very badly filed out of order; and for the best part of two hours I worked hard on what was really a ticklish job in dentistry, for that saw needed a new set of teeth. It got them, and I am rather proud of the job.

For sharpening an ordinary handsaw one needs four tools—triangular file of tapering shape; flat file; a saw-set, and a saw-clamp; My correspondent speaks of different sizes of triangular files, evidently being of the opinion that the various sizes will give different angles, but this is not so; for, no matter what the size of the tool, if we break it straight across, the surface will be an equilateral triangle; and any one who has studied geometry knows that, in such a triangle, each angle is of the value of 60°.

The flat file is to be used for jointing—that is, making the teeth all of one height.

The set is used for bending the teeth sidewise alternately, so that the cut made by the teeth will be slightly wider than the blade, thus permitting the blade to work freely.

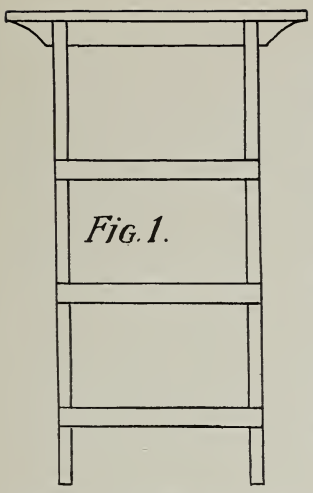


Fig. 1.

The clamp is to hold the saw in position while it is being treated, and is indispensable. I know whereof I speak, because in a fit of smartness I held the saw, on my maiden effort, in the bench-vise. I have just finished making a clamp like one I borrowed, every bit of the sawing being done with tools of my own sharpening, which worked cleanly and smoothly; so before the reader does any thing else he must make a saw-clamp. Fig. 1 shows the front elevation.

The classifications are: uprights, 2 pieces, 2×4×50; cross-pieces, 3 pieces, 1×4×21; vise, 2 pieces, ¾×2¾×30.

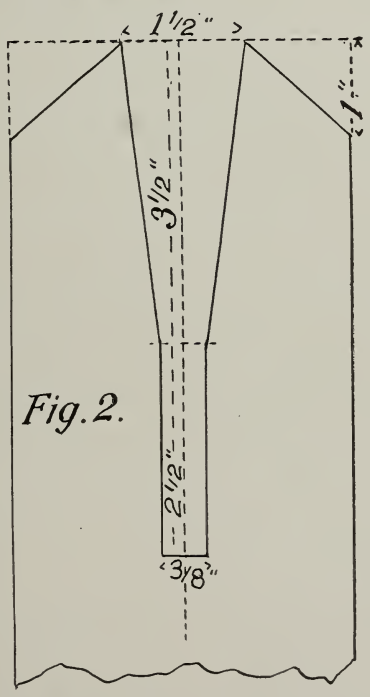


Fig. 2.

The lengths of the uprights will depend upon the height of the man who is to use the clamp. I find in my own case it is about six inches shorter than the distance of my armpit from the ground.

Begin work on two 2×4 stuff by drawing on the face at one end of each piece the design shown in Fig. 2; then saw out the center piece and cut off the corners; then nail on the three cross-pieces. The two pieces that form the vise are to be held in the V-shaped cut, and must, therefore, be planed to a suitable shape.

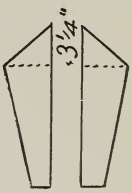


Fig. 3.

Fig. 3 shows the pair in cross-section with exaggerated space between. To lay out the work on one face of each piece, draw a line ¾ inch from an edge; then on the opposite edge draw a line right down the middle. Plane the marked face until the new surface is bounded by the pencil lines; then plane the other edge until a new surface extends from the pencil-line to the margin of the unmarked face.

Last of all, sufficient from the ends of each piece must be cut away to give room for the handle of the saw. Fig. 4 illustrates this.

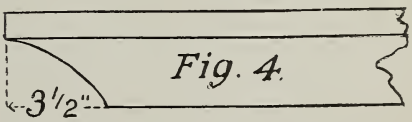


Fig. 4.

When you use the clamp it is better to be out of doors, because you will need lots of good light. There is no chance work in filing a saw; you must know exactly the shape of tooth you want, and *see* that you get it; so, set your clamp up against a fence and rope it tight to the railing so that it can not move.

SAWS AND THEIR TEETH.

The use to which a saw is to be put determines the shape of its teeth; consequently, for the proper sharpening of any particular saw one must know to what purpose it is to be put. This article is not intended to cover the whole field of saw-sharpening, but only such phases of it as may come within the scope of the average bee-keeper or farmer. The essential saws for such a one are cross-cut, rip, and back saws, for soft or medium hard woods, and buck-saw for the firewood pile; hence only these will be considered here.

The rip saw is used to cut in the direction of the wood; the other three, across the grain.

A saw-tooth has two functions—paring and scraping. The rip saw acts like a chisel, each tooth cutting out a piece of the fiber, which lodges in the throat of the tooth and is carried forward until free of the wood, when it falls to the ground. Since one tooth alone is responsible for each bit of fiber, both sides of each tooth must be equally sharp; in other words, the forward face must be at right angles to the body.

So much for the paring action of the tooth. Let us now consider its duty as a scraper. Scraping is done with a sharp tool held at right angles to the surface that is being operated upon. The bottom of the groove in which the saw runs is the surface that is be-

ing scraped, and this surface coincides with the line formed by the teeth of the saw; therefore, to get the teeth perpendicular to the surface of the bottom of the cut we make them perpendicular to the general

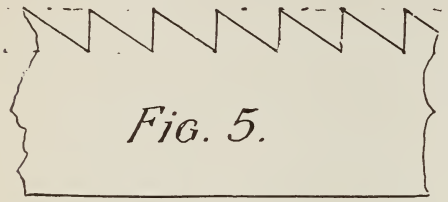


Fig. 5.

line formed by the points of the teeth. Fig. 5 illustrates the teeth of a four-point rip saw, such as is used for soft woods. The angle which the front of the tooth makes with the general line is called rake, hook, or pitch. In this case it is perpendicular.

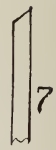
Right here it may be as well to explain that saws are classified by the number of "points" of teeth that come within the compass of one inch. The number of teeth is one less than the number of points. In most saws the number of points is stamped on the blade below the handle. For medium-hard woods a five-point rip saw is best, the teeth being dressed like the four-point.

CROSSCUT SAWS.

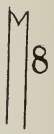
In cutting across the grain the fiber can not be wedged out as in ripping. It must be severed on each side as if by a knife-cut, so we see it takes two teeth to cut out each little bit of wood fiber that comes away. The front or cutting edge of each tooth must, therefore, be brought to a sharp edge like a knife — with this difference, however, that the bevel must be on only one side of the tooth — the inside. Again, we all know that it is very difficult to cut a piece of wood with even a sharp knife when the blade is kept at right angles to the direction of the stroke.

However, if we advance either the point or the handle ahead of the rest of the blade, cutting is much easier. For this reason the pitch of the tooth of a crosscut saw is generally about 60°. The only exception a farmer or bee-keeper is likely to meet with is the pruning-saw, where the pitch is usually almost perpendicular, like a rip saw; but the edge is beveled like a crosscut saw. The upright pitch is permissible because of the soft green wood it is used upon. A six-point crosscut saw is the best to use on soft wood where rapid rather than fine work is required. For medium hard wood a seven-point saw is better, while a general-purpose bucksaw has four points. Experts make a slight difference in the amount of bevel that is given the teeth of different crosscut saws; but for general use they may be all sharpened the same way.

Before dismissing this general subject of teeth it will be well to point out that, since both edges of each tooth are beveled, when we look sidewise at the tooth of a crosscut saw we see a little one inside of a big one. The upper corners are joined by a straight line; therefore when we turn the point of the saw toward us so as to get a profile view of a tooth we find it looks like Fig. 7, and two adjacent ones appear like Fig. 8. In a well-sharpened saw this groove should show all the way down when one sights along the edge toward the light. The more perfect you can make this groove the nearer you approach perfection n sharpening.



7



8

JOINTING THE SAW.

The first step in sharpening a saw is to joint it; that is, bring all the teeth to a uniform height. This is very important, for if one tooth be just a little above the general level, the saw will stop with a jerk right at that point. To test this, lay a bit of flat wood on the saw-bench and run a gentle stroke across the edge. When the saw suddenly stops, mark the spot and you will almost certainly find a high tooth right there.

I will suppose your saw firmly held in the clamp, the grip being tightened by hammering the vise firmly. Take a ten-inch sharp flat file without a handle; lay it on the teeth with the point toward the point of the saw and pass it along the teeth, repeating until all are of a uniform height. In a bad case of uneven teeth you may have to make quite a vigorous application.

SETTING THE TEETH.

As already said, setting consists of bending the teeth alternately from side to side. The flat side of the tooth is bent outward. The amount of set is determined by the size of the tooth and the nature of the job. Soft woods need more set than hard woods; wet woods more than dry. But use no more set than is actually necessary; for the more set, the more wood is cut; therefore more force must be applied. But whatever be the set it must be uniform throughout; but, luckily, this is easily got by the adjustable sets on the market. Using a Tainter's saw-set I find excellent results when the anvil is turned to No. 2 for the back saw, No. 4 for the seven-point hand saw, and No. 5 for the rip saw. All the set should be in one-half of the tooth, and should never reach to the body of the blade. In setting, begin at the handle on one side and finish that side before tackling the other.

FILING.

With a saw in fair condition the safest rule to follow is to put a new surface at exactly the same angle it had before. Push the file with a slow and steady stroke so as to use the whole length of it, always keeping the downward pressure uniform throughout the whole stroke so that the action on the tooth will be uniform from top to bottom of the tooth. On the return stroke, either lift the file clear or allow it to rest very lightly on the saw. Two strokes are usually sufficient for such a tooth as one finds in a six-point saw, while only one is usually enough

on the small tooth of a back saw; and, speaking of files, do start with a new one, keeping it clean and well oiled.

But suppose you are starting out to work on a saw that is badly out of order, such as my correspondent described—one that has been filed all kinds of ways, and set without any system; then you will have a job on your hands that will keep you busy for quite a while. First, see that your saw is so set in the vise that the lower part of the finished tooth will be very little above the level of the vise top—only enough for the vise to clear it, and you will then have a guide for the depth of the cut. Theoretically you are to work upon only one tooth at a time, but I find my file is busy with one on each side. Which will be filed the more will depend upon how the pressure is applied; and this gives one a chance to correct an uneven width of teeth; so when you apply the file to any particular tooth, compare it with the one on the other side of the file, and press hardest against the wider one, letting the other take care of itself. You will thus be able to get uniform width in the teeth of the saw.

THE TOOTH TO WORK ON.

Start work on one side at the end nearest the handle, and file each alternate tooth; then reverse the saw and file the remainder. You will probably be in doubt as to which tooth you are to work upon. I know I was. It is the one that is bent away from you, the one in which you can see the little tooth inside the big one; and you are to work on the face next to the point of the saw. So when the handle of the saw is on your right, the tooth you are to file will also be on the right of the tool; when the handle is on your left, the tooth will be on the left of the file.

ANGLE OF FILE.

The angle at which the file is held is important. We have two to consider—first, the angle with the perpendicular face of the blade; second, the angle with the line of the teeth. The first is always at right angles; so if the clamp is standing perfectly upright, then the file will be horizontal. The second angle is determined by the amount of bevel wanted on the teeth. In the case of a rip saw, where a square-pointed tooth is wanted

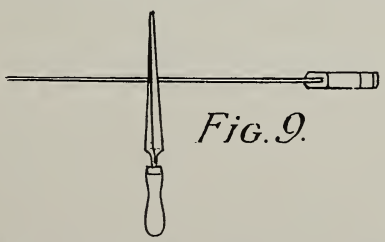


Fig. 9.

the file will be at right angles to the length of the blade. In Fig. 9 we are supposed to be looking down upon the teeth of a rip saw from above, and we see the file working at right angles to the line of the teeth. In crosscut saws, such as have been described, an angle of 45° is about right.

Fig. 10 shows the angle when we look from above. The cant of the file will depend upon the rake you want to give the tooth. With crosscut saws the top face of

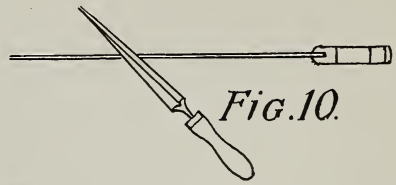


Fig. 10.

the file should be level in both directions; with the rip and pruning saws the face of the file working on the front surface of the tooth must be upright.

In working over an old saw that is in bad shape, bend all your thoughts in getting uniform depth of cut, width of teeth, and angle of bevel. Do not worry at this stage about the height of teeth or the angle of slope shown in Fig. 7; for if the other three are right, these two will probably take care of themselves, provided always the file is kept level and at the proper angle with the line of the teeth.

An old proverb says that an old violin is good enough for a beginner to practice on. Of course it is; for it is a better instrument than it was when first made. But an old bent saw with twisted teeth, sometimes wanting a few of these essentials, is not the best tool for first experiments in saw-sharpening. The possessor of a good saw with many broken teeth should send it to a saw-cutler who will strip off the old teeth and punch new ones in the new edge.

Let me conclude by giving the dimensions of saws that are recommended for such work as happens around the average apiary or farm:

	Length	Points to inch
Rip saw	28	4
Hand or crosscut	26	7
Tenon or back	10 to 14	10
Keyhole or compass saw	14 to 18	9 to 12

Victoria, B. C.

A STRUGGLE WITH EUROPEAN FOUL BROOD.

The Removal of the Queen and the Introduction of a New Italian Queen Effected a Cure; Goldens Preferred to Three-banded; the Alexander Method Followed.

BY EDGAR WILLIAMS.

I should like to give you my experience with European foul brood or the so-called black brood. The winter of 1903 proved to be a very severe one on bees in this locality. Most bee-keepers lost from 75 to 100 per cent of their bees during the winter and spring. My bees were wintered out of doors in single-walled hives packed only on top. I saved only four weaklings out of eighty good colonies the previous fall. Whether this had any thing to do with the disease I can not say—probably not. I am simply telling it as

a prelude to my story. I purchased three more colonies that spring, and moved them the fore part of June. They were perfectly healthy, as were the four I had wintered. The raspberry commenced to bloom, and it was followed by white clover, so that my seven weak colonies built up rapidly.

About the first of July I decided to begin preparations for increasing my apiary. I moved one colony to a new location and placed a set of combs on the old stand for the old queen. If the old colony had plenty of young bees left I intended to let it rear its own cells. On looking at the old brood a day afterward I was somewhat surprised to find that nearly all the bees had deserted it. I took away most of the sealed brood and gave it to other colonies for fear it would chill, massing the frames left containing partly unsealed brood in the center of the hive. It was now not much better than a nucleus. About ten days later I made an examination. The sealed brood had mostly hatched, but that which was unsealed had died and lay untouched in the cells. Half of it had turned to a dark-brown mass. I thought it was chilled brood, and it *might* have been, for the colony was perfectly healthy. When I divided it I gave the frames to several of the other colonies. The honey-flow continued a while longer—about ten days—and the dead brood practically disappeared. After the flow had ceased I noticed a large quantity of dead brood in several hives. I began to think something was wrong. Several in the neighborhood who kept bees were consulted. They had never noticed any such thing except an occasional cell, therefore they were inclined to think it was poisoned or starved brood, so I did nothing. Being anxious for increase that year I formed nuclei, raised queens, and then strengthened the nuclei by drawing brood from the stronger colonies. The seven colonies were increased that year to thirty, all of which were inoculated with disease.

GOOD PROSPECTS FOR 1905.

The bees wintered well, as I lost only three colonies out of thirty. The first batch of brood the bees reared appeared to be healthy, and I thought the disease had disappeared. This is something I have often noticed with the disease. The first lot of brood raised in the spring is, to all appearance, healthy. It is the second lot, or after that, when the disease begins to appear. But soon I noticed it in a few colonies, and by the latter part of May every colony but two was badly diseased. Some showed very few healthy cells. In some cases it seemed to affect the bees. Some colonies that had prepared to swarm, in a few weeks had scarcely enough bees to cover the brood. These, of course, were exceptional cases. Two colonies remained healthy. One was a hybrid; the other colonies left showed three yellow bands, although at that time I had introduced no new blood. The rest were all hybrids.

I sent a sample of the brood to the A. I. Root Co. They pronounced it pickled brood, or possibly foul brood, and advised me to give the bees the McEvoy treatment. I decided to follow their advice and do a thorough job. So on the first day of June, 1905, I shook all the thirty colonies, except the two healthy ones, on frames with starters. As I had no tight building to handle the combs in I carried the whole 28 set through our dining-room, up a flight of stairs, through a hall, into an attic. As luck would have it, mother did not notice the honey and bits of comb that got on to the stair carpet until the combs were all in the attic. Shaking the bees and carrying the combs into the attic occupied a whole day, and a hard day's work it was.

That evening I went to work extracting the honey out of the combs. Part of it was candied and would not come out. I worked past midnight, took a "lay off" next day, and worked past midnight the next night before I got the stuff extracted.

Next morning I built a fire under the big iron kettle, went up into the attic, cut the combs from the frames, put them in sacks, and carried them down and put them into the kettle to render into wax. I had just completed stacking the combs, and had part of them in the kettle. The wax was about ready to boil over when mother came to the door and informed me that the attic was full of smoke—the house must be on fire. I hurried into the house and up into the attic, distinctly remembering that, the *day before*, I had had the smoker up there driving some bees out of doors that had clustered on the windows.

Pierpont, Ohio.

To be continued.

THE VARIATION IN ORANGE HONEY.

BY EDWIN G. BALDWIN.

My dear Mr. Root:—You will note in the article by Mr. H. F. Hart, of Alabama, page 738, Dec. 1, that he names titi and black tupelo, sweet gum, gallberry, and loquat as possible sources of contamination with the pure orange nectar. I am much obliged to him for his kindness in calling my attention to what he believes are possible sources; but locality has so much effect, he naturally supposed that, because we live in Florida, we have all the trees, shrubs, etc., that are to be found anywhere in the State, and have them right here in range of our bees at Deland.

As a matter of fact and interest, the titi and black tupelo do not extend further south than the northern end of Lake George, northern end of our county, sixty or more miles from us. That is the southern limit of their growth. The loquat is here in fairly large numbers; but it is now in bloom, and will be till early January. It is in fruit, not blossom, by the time oranges come into blossom, and can not possibly be a source of any of the honey in the supers at orange-blooming time unless it be carried up by the bees later in giving the queen room, as stated in my article on orange honey in your columns.

The gallberry (our holly) blooms, by actual tabulation, from the 23d of April (the earliest noted) to the 11th of May, the average being the 5th of May or thereabout. It is too late to come into our orange crop, as we extract as soon as the last orange-blossoms are gone. That leaves but the sweet gum in the list named by Mr. Hart. If our bees worked on it here it would be a source, I admit. But I have never, in all my observations, seen any bees on sweet gum in our section. Whether it does not yield honey, and whether climate and soil can be accountable, are questions I have not yet been able to determine. I have sent another sample of this year's orange-blossom honey to Mr. Younge, of Washington, and await his verdict on the pollen-grains with deep interest. By the way, I sent him a sample of California orange honey (so called), and was not surprised to hear that there were no clear-cut grains of orange-blossom pollen in it, for I had already made up my mind that it had very little if any of the real orange. It did not have the taste nor color nor odor; and the pollen grains only confirmed the other attributes. As I wrote Mr. Hornor, of Jenkintown, it is probable that much light-colored well-flavored honey from California is sold under the name of "orange honey" for the sake of the suggestiveness of the term, just as much tupelo honey from Florida is sold by that name in New York and other cities, as I happen to know from talking with large dealers there; at least this was so before the passage of the pure-food act. How it may be now, I do not know; but this sample of honey from California was surely masquerading under the title of a honey that it did not deserve. Large shippers of East Coast oranges from Florida tell me that much fruit from that section is sold as "Indian River Oranges" just because that particular region happens to produce the finest fruit grown. May it not be so with some of the honeys from California? If so, ought not the pure-food act to have a word to say in the matter?

Deland, Fla.

SWEET CLOVER.

Profit in Growing, Sowing, and Cultivating it, and How to Make it a Most Valuable Crop.

BY R. L. SNODGRASS.

To produce the first crop of sweet clover, sow 20 lbs. of the seed per acre any time between Dec. 1 and Feb. 1, as the seed always germinates best if it freezes a few times in the ground. About the first of September it is well to turn stock on the clover, and pasture it until the first of December, as it will keep green until this time, and even later.

The following spring one may pasture it for two or three weeks; and if it is not grazed too long it will give a good crop of bloom and seed; if it is pastured too long it will not grow so tall, and the blooming and seed crop may be cut a little short.

As soon as the seed crop is cut, plow the ground and sow to buckwheat or millet; and as soon as either of these is harvested the ground is in fine condition to disc to wheat. I do not consider it advisable to sow more than half a bushel to three pecks of wheat per acre if a good stand of sweet clover is desired the following spring, as too heavy seeding of wheat tends to smother out the clover. If the wheat is not too thick the sweet clover will come up in the wheat from the seed, and the following year another good bloom and seed crop can be produced. One can again go through the same routine as before. I have the best stand of sweet clover that I ever had, that I managed in just this way.

It always pays to plow up a field after a seed crop has been cut, for a good stand is never secured after a seed crop has matured, as the old plants smother out the young ones. Hence I recommend plowing it up; in fact, the clover does better if a field is plowed up every two years.

Any one managing a field in the way I have described can well afford to pay $5.00 per acre, cash rent.

There is no other clover that is such a soil-renovater as sweet clover. I have been pasturing my clover ever since one month after I cut the wheat. When I turned my cows on it they doubled the flow of milk, and it is still green as it can be at this writing, Dec. 5, and my cows are still grazing on it—the white clover. I have also a fifteen-acre field of the yellow variety on rented ground that is about one foot high, and just as green as in mid-summer. I haven't turned the stock on this yet, but expect to do so soon. I prefer the yellow variety to the white, as it is an earlier bloomer and makes more pasture, as it will stand closer grazing. The hay is also much finer, and cures more quickly, and therefore is ready to stack much sooner than the white; and I believe, too, that the stock eat it more readily.

Now, the most important feature of it all is that it is an earlier bloomer by two or three weeks than the white or alfalfa either, and consequently it puts the bees in good condition for the alfalfa honey-flow; and if the first crop of alfalfa fails to bloom, as is usual in Kansas, the yellow sweet clover lasts until the second crop of alfalfa is in full bloom. I had 100 colonies last season that had only eight or ten acres of the yellow variety to work on, and my colony on scales gained about 2 lbs. per day for 30 days, on the yellow variety of sweet clover, between the first and second blooming of alfalfa. Now, if this will not put all colonies in shape for the second blooming of alfalfa I don't know what will unless it is heavy feeding, and that is rather expensive and not so easy. And in addition to the benefit my bees and stock derived from it I secured about 2000 lbs. of cleaned hulled seed.

Augusta, Kan.

COMMERCIAL QUEEN-REARING.

Are Not Some of the Modern Methods to Blame for so Many Poor Queens Sent out by Queen-breeders?

BY J. L. BYER.

As I have never reared a single queen by the artificial methods now in vogue it may look like sheer presumption to make any comments on the subject of commercial queen-rearing. However, though I have not reared any queens I have nevertheless bought a good many; so, by way of apology for my statements, I will talk from the standpoint of the consumer rather than from that of the producer, in so far as the trade in queen bees is concerned. At the Ontario convention, held in Toronto last November, much time was taken up in discussing this very important phase of the industry, and the members had the pleasure of having two of our commercial queen-rearers present, and of listening to each of them as he gave a practical and lucid address.

In the discussion that followed these addresses, many of the members commented on the great difference in the queens received at different times, even from the same breeders. While it was generally admitted that there is always considerable variation in queens reared by the ordinary methods, yet the idea seemed prevalent that the variation is much more pronounced in queens reared under the new commercial methods.

J. W. George, page 763, tells of the double-grafting method used by some apiarists in California to ensure the generous feeding of the queen larvæ; and the question arises as to whether queens reared by modern methods are not apt to be neglected in this line. If that is the case, it seems reasonable to believe that poorly fed larvæ might account for a lot of the poor queens that are undoubtedly sent out by queen-breeders. This point was brought out in the convention, and I mentioned the fact that, in my experience, the great majority of queens reared under the swarming impulse certainly do not suffer in this respect, as nearly all cells have a surplus of royal jelly left in the base after the queen has emerged. Whether this is the case with pure Italians or not I can not say, as I do not remember having had more than two swarms from this race of bees. The reasons for this are that I use large hives, and nearly all our bees have Carniolan blood.

From a recent experience I have had, I feel convinced that sometimes *something* out of the ordinary occurs at times, even with the best queen-breeders, with the result that a whole batch of poor queens is sent out at the same time. For a number of years I have bought queens from a man who has an international reputation, and nearly always these queens have turned out well—so well, in fact, that I have repeatedly recommended these queens when out on inspection work. To make a long story short, in July, 1908, I received quite a large bunch of queens from this breeder, for my own yards and for a yard belonging to a bee-keeping friend. All wintered well, and this spring appeared to be in ordinary condition as compared with the rest of the bees in the same apiaries. As to actual results, strange to relate, there was not a single queen in all the number received by either of us that was worth much more than the cage she came in. This is, of course, comparatively speaking, as some of the colonies with these queens did store as much as 50 lbs. of honey in apiaries where the general average was around 150 lbs.

Now, while I am not going to say that this batch of queens had been partly starved while in the larval stage, yet conditions at the time of their rearing were wrong in some way, else why should the whole lot have turned out so worthless when, as a rule, queens received previously had given a good account of themselves.

I leave the problem to be solved by those who are in the business—particularly to the one most interested. In this case I deemed it my duty to tell the queen-breeder how his last lot of queens had turned out, and his letter in reply says that he can not understand it unless it was caused by the drouth. Presumably he refers to the drouth of this past season; but as to why it so affected his queens, and not others in the same yard, is not explained. I frankly confess that the answer received from him did not tickle my vanity any, as I decided that he must have a very poor opinion of our judgment in the matter to advance such a reason.

DOES EUROPEAN FOUL BROOD VARY IN VIRULENCE IN DIFFERENT LOCALITIES? GOLDEN BEES MORE IMMUNE.

Dr. Miller's account of his dealings with black brood will be read with interest by many here in Ontario at the present time, as we have in our province an outbreak of this disease. From my experience with this plague I can not but believe that the disease varies greatly in its virulence, and what we have here in Ontario is much worse than the brand at present around Marengo, Ill.

Certain it is that the Alexander system of treating the disease is worse than useless here, as it simply takes up valuable time and gives no good results. Even after the most thorough purging, it will reoccur in a great many colonies; and at present Mr. Warrington Scott, the inspector in the infected district, believes that only by thoroughly Italianizing all stocks is there any chance of getting rid of the pest. More than that, he will not stop with the ordinary Italians, but insists now on the goldens as being the only ones likely to keep immune from the disease. Mr. Scott is one of our most thorough apiarists, and has lost thousands of dollars from black brood, so his opinions are worth taking into consideration. Personally we have been rather prejudiced against the very yellow bees on account of their poor wintering qualities, especially when left outdoors; but if they are immune to black brood, that cer-

tainly will hide a multitude of sins, especially in sections where the disease is already established.

IS HONEY-DEW AN EXCRETION?

I for one shall be more than pleased if D. M. Macdonald's view, page 763, Dec. 15, is established as to honey-dew not being an *excretion*. I *hope* he is right, so much that I almost *believe* already that his view will be substantiated. The subject of honey-dew has, with my present knowledge on the matter, always been the *one* subject that I did not want to explain to the prospective bee-keeper, and especially so to the buyers of our honey. As the editor pertinently remarks, entirely too much has been said on the excretion phase of the question, which, after all, now seems to be a debatable question; and in the light of friend Macdonald's opinions it may prove to be a libel on the honey industry.

Mount Joy, Ont., Can.

[There is no denying the fact that different batches of queens will vary somewhat, according to the season. Any queen-breeder of experience knows that it is much more difficult to rear good queens during a drouth than during a honey-flow. Practically all of our best breeders have found it absolutely necessary, during a dearth, to feed copiously those colonies that are rearing cells. Some even go further and make the cell-builders queenless, broodless, and combless for a few hours, feed copiously, and then give them one comb with a bar of grafted cells. No matter how severe the drouth, such bees will build as fine cells, and supply them as copiously with royal jelly, as bees directly under the swarming impulse.

But it sometimes happens that a queen-breeder who has been depending upon the natural honey-flow gets caught. Before he knows it the supply of nectar has suddenly stopped. Unless he is able to take a "stitch in time" by feeding the cell-building colonies, the queens from those cells will be of low standard. While we do not know that this was so in the case of the queen-breeder mentioned, it might have been.

Regarding European foul brood, we doubt very much whether there was any difference in its virulence in different localities; but we do know that a difference in the strain of the bees does have a marked influence in the matter of cure. It is possible that, in some localities, there is more of the Italian blood than in others. It is possible, also, that there is a strain of blacks, with just enough of Italian blood, that will resist the plague as much as or more than the Italians. Dr. Miller uses hybrids very largely. It will be remembered that he has been working for years to produce an extra energetic strain of bees without regard to markings. That he has to a great extent been successful is borne out by the fact that he has secured high averages per colony. This was especially true in 1908. Now, it is possible that the Dr. Miller strain of hybrid hustlers also have a great resisting power against European foul brood—as much as or more, perhaps, than some of the good strains of Italians.

Whatever the merits of the Alexander treatment, or the treatment as modified by Dr. Miller, it would seem to us that it would be wise to combine the McEvoy and the dequeening process of Alexander and Miller. Speaking about Mr. McEvoy, it will be noted that, in the editorial department elsewhere, he says Dr. Miller's experience in the matter of treating European foul brood is quite in line with his own. Mr. Percy Orton, of New York State, who appears to have had a large experience, claims that he has known all along that the Alexander method of treatment, even before Alexander gave it to the public, was effective.

We shall be glad to get reports from others who are able to offer testimony on the effectiveness of the Alexander plan of curing black brood. We are not seeking favorable reports only; we want the *unfavorable* as well. Mr. Orton feels that European foul brood is easily handled, and it certainly is if the Alexander-Miller form of treatment or the one used by Mr. Orton is effective.—ED.]

SOME OBSERVATIONS ON THE HABITS OF THE HONEY-BEE.

Bees Gathering Wax.

BY WM. M. WHITNEY.

Mr. Editor:—Dr. Miller, in Stray Straws, July 1, refers to bees being seen loading their pollen-baskets with wax which they found outside the hive. It has been a common observation in my yard, when bits of comb outside have sufficiently softened by the sun to be worked; also, later in the season, I've been very much amused watching the bees gathering propolis left where the sun's rays had softened it. I have many a time seen them filling their baskets with it, glistening in the sunlight like little brown beads. My entire time for thirteen years and more has been spent in carefully watching the bees.

HOW TO TELL FROM THE OUTSIDE WHETHER A COLONY IS PREPARING TO SWARM.

The question is sometimes asked if it is possible to tell from the outside appearance of a hive whether there are indications of swarming before it actually occurs. This question, I think, was asked at one of the meetings of the Chicago and Northwestern Association, and it was generally conceded that there was no way to tell. Notwithstanding all this, I believe there are outward signs of swarming; but it requires careful watching to discover them. There is a marked difference in the appearance of young bees out at play, as it is termed—marking their location—from that of old ones apparently doing the same thing. When one sees *old* bees during the swarming season come out and fly before the hive like young bees at play (excepting at a time when they have

been kept in by a spell of bad weather, at which time they are simply marking their locality anew) and settle down, then come out again in the same way, you may conclude that, in a very short time, a swarm will emerge — often within a few minutes; but sometimes an hour or two may elapse unless a sudden change of the weather occurs to prevent, which, of course, will delay it till favorable weather. At the yard at Barrington a few days ago two colonies which I had predicted, from outward indications, were liable to swarm, came out in a drizzling rain, and we hived them while it was raining. This act of flying in front of the hive is often repeated several times; and when it occurs in quick succession, put your ear to the hive and you will be likely to hear an unnatural uproar all through the hive, which immediately precedes the grand rush.

MEMORY OF PLACE IN BEES.

I was very much interested in articles under head of "Are Bees Reflex Machines?" and especially in that of July 1, "Memory of Place in Bees." Observation and experience in the bee-yard have taught me many things which have a direct bearing upon the matter of orientation; hence the special interest in the subject under discussion. It is a well-known fact that, when bees swarm, if the queen does not follow they ordinarily return to the parent hive, or, in other words, to the old stand; yet it is easy to deceive them, if the parent hive is the end one in a row, by putting an empty hive at the end beside it, into which they will go, although their own hive stands not a foot away. Their memory recognizes the end hive as theirs. So it is with bees returning from the field to an end hive in a row. If another is placed at the end beside it they will persistently try to enter the end one. An experiment of this kind was made less than three weeks ago at a yard where a young apiarist was being instructed in the management of bees. They were flying freely, and in less than five minutes the front of the hive and alighting-board was covered with bees trying to enter the wrong hive, while theirs was not 18 inches away. Again, who has not tried the experiment with bees that have had the habit of using one end of the entrance to the hive of forcing them to use the other end, and watched their persistency in trying to enter at the old place? All this seems to be the result of memory purely. Practical bee-keepers, however, have learned that, by confining them for a short time, say three days, they forget their past location—hence the ability to do many things in the manipulation of the hive which otherwise might be impossible to accomplish.

I am convinced, from watching bees in my own yard, that where hives are put in rows, and near each other, and where there are no trees, shrubs, or other landmarks to mark location, there is much more mixing than is generally supposed — especially if bees are of the same strain, and more particularly with young bees that have not clearly marked their location, and that many valuable young queens are lost in this way. I say *of the same strain;* for my bees, being Italians, no black bee would be permitted on the alighting-board for a minute. The same is true of feeding outside. It has been a common thing for me to feed outside; and the Italians mingle together without the least trouble; but let a black bee from a neighbor's yard alight among them and he, she, or it is pounced upon instantly.

CAUCASIANS REAR MORE DRONES BECAUSE THE ORDINARY WORKER-CELLS ARE TOO LARGE FOR THEM.

In the June 1st issue you refer to Caucasians as great drone-producers, which seems to be a common complaint. I have had some experience with them; and while I can not say that I am an ardent admirer, yet I think we ought to "give the Devil his due," or, in other words, these bees. You know they are smaller than the ordinary bees we are accustomed to, and, as a matter of course, use smaller worker-cells for brood rearing; and when you force them on to foundation with but slightly if any smaller cells than their drone-cells, it is most natural that they should produce a large number of drones. Either give them proper foundation or let them build their own comb without interference, for then you are in a situation to judge them in this particular.

Evanston, Ill., July 15.

[The publication of that very interesting series of articles entitled "Are Bees Reflex Machines?" by Dr. von Buttel-Reepen, did not evoke the discussion that was expected. We consider this one of the most valuable contributions on practical apiculture that has ever been given; possibly the title itself led the average reader to believe that the series related to some abstruse scientific observations that were beyond the comprehension of the ordinary lay mind. This was far from the fact. The discussions are easily within the grasp of any one, and now that we have the work in book form many of our readers would do well to read it consecutively. Buttel-Reepen explains many of the phenomena that occur in the bee-yard; and these explanations will show the producer how to make more dollars out of his bees, for, understanding their nature, he is better fitted to make them serve him. Mr. Whitney, Dr. Miller, and a few others seemed to appreciate it at its real value.

Regarding the Caucasians, we doubt very much whether they are any smaller than ordinary Italians. At one time the statement was made that the Carniolans were larger. Looks are deceiving. As a matter of fact, the three races appear to pass the zinc excluders with equal facility. We doubt, therefore, if our correspondent is right in concluding that Caucasians would build more drone comb because combs from worker foundation are too large. If we understand correctly, Caucasians in their natural habitat, on their own virgin combs, run excessively to drones—much more so than Italians. —ED.]

A NEW SOURCE OF HONEY-DEW.

A Scale Insect is Discovered in Massachusetts which Secrets a Considerable Quantity.

BY DR. BURTON N. GATES,
Bureau of Entomology, Washington, D. C.

[These observations were written for the *Journal of Economic Entomology*, Vol. II., Dec., 1909, No. 6, pages 466,467. In order to bring them before the bee-keepers, a paper has been prepared for GLEANINGS.—B. N. G.]

It is generally known that honey-dew is secreted, not alone by plant-lice or aphids, but by some scale insects, leaf-hoppers, etc. For instance, *Lecanium oleae*,* a scale upon the citrus fruits of California, produce great quantities of honey-dew which collects as a coating upon the leaves of the trees, and is a medium for the growth of a fungus, *Capnodium sp.* The mycelium of this fungus is sometimes so luxuriant as to form a felt over its leaf, closing the stoma and thus killing the tree.

A source of considerable honey-dew, other than from plant-lice, was discovered by the author at Amherst, Massachusetts, in May and June, 1908. Large numbers of bees were observed humming through the spruce-trees on the campus of the Massachusetts Agricultural College. At times the roar was suggestive of a swarm. Closer examination also suggested that the bees were gathering propolis materials from the resinous exudations of the spruces. None, however, were seen with a burden packed upon their legs, as is the case when collecting propolis.

By following single bees it was possible to see them alight on twigs near the union of the last two years' growths, and search with outstretched tongues for something apparently sweet. At the bases of what appeared to be the dormant buds on the twigs, the bees found their sweets and set to work as vigorously as at drops of nectar. Upon crushing this bud-resembling structure they were found to be made up of animal tissue instead of plant tissue. They proved to be living insects—scale insects. There were thousands of them on the spruces from which the bees were collecting liberal stores of honey-dew. Some scales apparently produced more of the substance than others, because frequently dried crystals or globules of honey-dew were noticed at the base of the insects.

Specimens of the insects were sent to Mr. J. G. Sanders, of the Bureau of Entomology, who determined the scale to be *Physokermes piceae* Schr., "A European species which affects the spruces and only recently has been introduced into the United States." In Massachusetts it has been collected in at least three localities. The species is not likely to become a serious pest to the spruces, Mr. Sanders wrote, because of its numerous parasites; consequently, kee-keepers will probably not be greatly annoyed with the honey-dew which it produces, as compared, for instance, with the enormous quantities from plant-lice.

Washington, D. C.

*Kellogg, Vernol L., 1905, American Insects. New York: Henry Holt & Co; viii—674 pp. See page 187.

DO BEES STEAL EGGS?

Some Proof to Show that Eggs were Carried from Another Hive and Used for Starting Cells.

BY M. T. PRITCHARD.

On p. 781, Dec. 15, the editor asks for definite facts regarding the stealing of eggs by queenless bees with which to raise themselves a queen. In the early part of the season of 1906 we had trouble with our queenless colonies used for grafting. Nearly every day we found cells started with either eggs or young larvæ in them, resulting in the bees refusing to accept the grafted cell given to them. This we could not account for, as these colonies are not used to graft into until five or six days after they are made queenless. Occasionally one of these cells would be overlooked and a virgin hatch, each of which proved to be a *black* virgin.

All colonies in the yard were Italians with tested Italian queens except one. This was a fine imported Carniolan queen kept in a very weak colony to prevent her from rearing any drones; consequently we concluded that the queenless bees were stealing eggs from the Carniolan colony; and to test it we saved several of these cells and hatched them, and found that each one produced a typical Carniolan virgin. We then removed the Carniolan colony from the yard, and had very little trouble with natural cells from that time.

Our theory is that the Carniolan colony being light, or from some other reason, did not defend its entrance as well as the other colonies, and the queenless bees found it an easy place to steal eggs.

Medina, O., Dec. 27.

[Mr. Pritchard is the man in charge of our north yard, the one who, in fact, raised nearly 3000 queens, with the help of a boy, in a space of about four months. If robber bees can steal honey from other hives, we see no reason why a dire need of eggs should not impel bees to get the eggs from some other colony. It is altogether improbable that they would attempt to steal them from a strong colony, but, rather, find some weak nucleus, just as they did in this case. The fact that the eggs in the pure Italian colony developed into *black* queens seems almost absolute proof that the eggs in question were stolen from this Carniolan colony, and carried to this Italian colony and placed in the cells. It only illustrates how nature will sometimes take extraordinary means to prevent extinction of the individuals, or, in this case, a colony of bees.—ED.]

HEADS OF GRAIN

FROM DIFFERENT FIELDS

SPACING DANZENBAKER FRAMES WIDER FOR EXTRACTING.

I was much interested in the question asked by Mr. Richard Hanlon, page 785, Dec. 15, and your answer to the same on the next page. I have reference to the one about spacing Danzenber frames for the purpose of producing extracted honey. This question is, I think, a very pertinent one to us bee-keepers who are using the Danzenbaker hive. Thus far I have never produced any extracted honey; but as I see my apiary increasing, and learn through reading the journals that extracted honey is easier to produce, that bees swarm much less—or, rather, swarming is easier controlled—and that it is as profitable withal, it brings forward very forcibly this question of extra spacing in the supers. The writer has spent many of his spare moments in trying to devise ways and means to that end. I should like to ask why The A. I. Root Co. could not, by making a slight change in the metal spacers used in spacing the Hoffman frames, give us a spacer that would be practical. The change, as I see it, would be to make the central space of such spacer wider, so it would extend clear across the top of the end-bar of said frame. Why could we not use staples in alternate sides of end-bars? I realize that there would be some disadvantages connected with such forms of spacing the Danzenbaker frame—one thing, the end-bars fitting so close to the cleats that the bees would, I think, propolize them fast to said cleats; then, again, if one wished to lift a frame of brood out of the brood-nest to the super above, which, I understand, is considered desirable, it would not work very well with the staple-spaced frame; but if the metal spacers were used it would not be so bad, and certainly would be better, on account of uncapping, than to use the frame in the super the same as it is used in the brood-nest. Then there is another thing: I suspect the bees would work to the disadvantage of the bee-keeper if these frames were spaced as I have intimated above; and that is, to build comb clear around the edges of the end-bars and attach it to the body of the hive.

Robbinsville, N. J., Dec. 27. J. L. HOWE.

[While it would be possible to space closed-end Danzenbaker frames wider apart by means of staples or other device, we would not recommend it. We doubt very much if the gain in thicker comb would compensate for the extra expense and annoyance in handling these closed-end frames with additional spacers. On the other hand, Hoffman frames can be spaced so that eight of them, or even six, will fill a ten-frame hive-body. The advantage of spacing such frames wide apart lies in the fact that extra thickness of comb will reach out to or beyond the width of the widened ends, thus clearing the uncapping-knife. Notwithstanding this, however, the majority use Hoffman frames, for extracting, spaced in the regular way, placing all the frames in contact with each other. If this is true, there is no reason why the user of Danzenbaker frames may not do the same thing.—ED.]

GIVING AWAY BUCKWHEAT SEED.

You mention the fact of giving farmers buckwheat as seed, in the interest of your bees, as fall honey bloom. Will you please tell me how much seed they sowed to the acre? also, with you, what per acre generally has been their return? Is there inducement enough to stimulate them to continue? At what price can it be had at Medina? Does it yield a nectar that sells well on the market? Any information you can give me will be appreciated. M. F. SOULE.

Crestline, O., Dec. 29.

[The amount of buckwheat to sow per acre depends somewhat on the time of the year, the kind of land, and probably something upon the locality. In and about Medina we sow, on rich land for early sowing, one peck per acre; on poor thin land, two or three pecks; as late as Aug. 1, four pecks might be required. A five-peck seeding as early as July 15, on any good land, is inclined to run too much to stalk, to lodge, fall down, and amount to nothing. This lodging may be corrected somewhat by the use of commercial fertilizer.

Our experiments during the past summer in growing a considerable acreage of buckwheat in the vicinity of our north yard was indecisive as to the amount of honey gathered. Our bees flew often enough to the fields, but the yield of honey apparently was not as large as from the crop that was sown on May 15 near our home yard. This made a splendid growth, and the bees were very busy on it nights and mornings. Contrary to what we expected, we harvested a good crop of seed. The conditions of weather for this early sowing were exceedingly favorable that year.

As to the amount of buckwheat that can be secured per acre, that depends upon the land and the kind of season. We have harvested as high as 45 bushels per acre. While this was good for Ohio, it would be considered a moderate yield for Northern Michigan, Wisconsin, Canada, or New York.

We would generally advise sowing right after plowing up wheat stubble. In this way we get two crops off the same land.

The honey from buckwheat is dark-colored, and a good many people regard it as the finest of all honeys for eating. Some who were brought up in the buckwheat sections of New York highly prize this dark honey, preferring it to the best clover, basswood, alfalfa, or sage. The average consumer, however, does not care much for it.

Buckwheat brings in Medina at the present time about 70 cts. per bushel.

Fuller particulars on buckwheat-growing may be found by referring to pages 317, 347, of last year's volume of GLEANINGS.—ED.]

CANDIED EXTRACTED HONEY AS A WINTER FOOD FOR BEES.

Kindly allow me to make a correction. On page 772, Dec. 15, I state, "On this account we have adopted the plan of feeding between March 1st and 15th," etc. This should read "between March 1st and May 15th." On p. 786 of the same issue I find the heading, "Candied Honey for Winter Food." I tried candied extracted, but do not like to use candied honey in the combs. I have, however, used a great deal of candied *extracted* honey, feeding it in the months of December and January. I used several hundred pounds in the winter of 1908, and also some this winter. I place a shallow super or extracting-box on top of the hive, lay a board across the frames, place thereon ten to twenty pounds of granulated honey, and cover with a piece of burlap. The bees so fed come out in good condition.

This might be a failure in a severely cold climate. The winters here are open, sunshine nearly day, enabling the bees to fly every day with very few exceptions.

Hagerman, N. M., Dec. 27. H. C. BARRON.

NO GNAWING WHEN HALF-SPLINTS ARE USED.

I find that, when splints are boiled a few minutes only, the bees will gnaw them; but when they are boiled an hour the wood becomes saturated with wax so that the bees do not seem inclined to gnaw.

I used many splints last season, and have tried both ways; but I find that, when they are boiled a long time, the bees do not bother them. I use only half-splints, because when I let the splints extend down to the bottom-bar the bees gnaw the two lower inches, so I tried cutting the splints in two in the middle, and have had no trouble since. H. E. Crowther uses only half-splints, and I have never found any gnawing in his yard.

I take a bunch of 500 splints and tie a string around each end, and cut it in two in the middle and drop each half bunch into boiling wax. Any number of splints may be boiled in this way, and those not needed may be laid away to be used at another time, when it is necessary to drop them into boiling wax for a few minutes only. GEO. E. COFFIN.

Parma, Idaho, Nov. 22.

TROPICAL GRASSES FOR SPLINTS.

I notice that some substitute for splints is wanted that the bees can not gnaw. Such a substitute could be found in some of the grasses growing in the East Indies. I have not seen them grow, but I have seen broom-grasses bought in Singapore that I am sure would be the very thing. The color is brown, and they are very stiff. They are used for scrubbing decks.

STEPHEN ANTHONY.

Waitete, Auckland, New Zealand, Nov. 8.

MOVING BEES IN MID-WINTER.

I moved a load of bees on a sleigh last winter in February a distance of five miles, and I never had bees come out of the cellar in the spring in better shape.

Haskinville, N. Y. M. C. SILSBEE.

OUR HOMES

BY A. I. ROOT.

Thou shalt not covet.—EXODUS 20:17.

There are good people in this world—a lot of them—people who, we might almost say, never do any thing that they *know* to be wrong. I often think myself that I do not feel that I want any thing that belongs to somebody else. A stalwart friend of mine, and a hard-working man, once said to me, "Mr. Root, I do not want a copper that I have not honestly earned;" and I think he told the truth. I replied, "Neither do *I* want a copper that I have not honestly earned."

Well, this friend went on to say that this text at the head of my talk was all right; but when it came to keeping that commandment he thought it was a rather tough matter. He was an earnest Christian man too. I quote his language as nearly as I can remember: "Paul tells us about a thorn he had in his flesh. Well, do you know, Mr. Root, I have been having a thorn in my flesh? It follows me like a low-lived dog; and, no matter how much I kick and abuse that dog, and shake him off, he seems soon to catch up, and to be pushing his nose into my affairs, getting his head between my feet, and sometimes he almost pesters the life out of me. But the Lord said, 'My grace is sufficient for thee,' and I have found it so."

That stalwart Christian man then related to me an incident of that low-lived dog which is worth repeating here. He said:

"It occurred right in church on God's holy day, surrounded by good Christian people; and, besides that, I was sitting close up beside my pastor, whom I loved and admired. Before he commenced his lesson he explained that our Sunday-school was going to make an appeal for money for a special cause, and he very much desired that his Bible class should set a good example. So saying he put his hand into his pocket and took out a quarter. I also took out a quarter. He asked the man who was taking up the collection to hurry up as we were already late in getting started. Now, the quarter I had in my hand was bogus, and I knew it. As my fingers slipped over the smooth coin it awakened old recollections, and I could not think at first what it was that conscience was prodding me about. As the collector came along he put out his hand for my contribution, and I recollected that the coin was bogus. As quick as lightning, that dog I have been telling you about, that had followed me all my life, suggested that the coin was innocently received by me, and it was not my business to lose it. For a moment I meditated putting the coin back into my pocket and getting something else for my contribution; but this dog or devil was suggesting that I was hindering matters—to 'let it slide,' and I did."

I started this Home paper with the expectation of saying something about making and *passing* counterfeit money. Somehow or other the above incident makes me feel as if there were a good many of us who have dogs following us; but "my grace is sufficient for thee."

Why should *anybody* be willing to have any thing to do with counterfeit money? Where a man deliberately sends, say, $2.50 of good money for $25.00 that is counterfeit, and in return gets a box of sawdust, we say it is good enough for him. Every little while our United States detectives are getting hold of counterfeiters; and a good deal of the time they find *women* assisting in the work. We can imagine a man who wants money he has not earned; but the whole wide world naturally expects something better of women. I believe that counterfeiters excuse themselves by saying that Uncle Sam is so rich he will not mind it and never know it. What kind of philosophy is that? If the world could be cured of the sin of covetousness there would be no stealing—certainly no highway robbery. What an awful picture of total depravity comes up before us when we read of a highwayman knocking a man down and pounding him into unconsciousness in order to get his watch and money! This wretch in human form pounds and mutilates a poor hard-working man just as he would pound or mutilate somebody who had wronged him or injured him in some way. When a murder is committed, a great many times the criminal tries to maintain that he did it in self-defense—he had no choice but to kill or be killed. But this hold-up fellow or fellows have no such claim at all. They waylay an innocent honest person who is guilty of no offense unless it is that of being in a lonely place at a late hour of the night. Oftentimes a day laborer is waylaid, and may be crippled for life, if not killed outright, just to get hold of his meager earnings; and of late, *women* have been knocked down and choked in order to stop their screams, that these wretches might get hold of their pitiful earnings. Of course the saloon and the drink habit are at the bottom of most of this business. Every little while forgeries are unearthed, and cases of systematic stealing that had been going on sometimes for years. All of these terrible crimes are the outcropping and culmination of breaking that one commandment, "Thou shalt not covet."

We are often told that prevention is better than cure, and that the remedy for these crimes—at least the most sensible remedy—would be to commence away back. Teach the little children to have a *sacred regard* for what belongs to somebody else. Explain to them how wicked it is in God's sight even to *desire* what belongs to another. Teach them that a coin found on the sidewalk is not their own—at least until they have made every possible effort to find out who dropped it and to whom it justly belongs; and teach them, above all things, to respect the money and property that belong to the great public. Why is it that we constantly hear of so many people who, without conscience or scruple, appropriate public money? Our hard-working people are taxed; and, thank God, they are beginning to wake up and inquire *why* and for *what purpose* they are being taxed.

Those who live in growing towns and cities have grievous burdens thrust upon them; and yet public officers—men who have been considered straight and square when they are put into office (and have an opportunity) if they discover that nobody is watching them, because, perhaps, the people have unlimited confidence in their integrity—when they discover, as I have said, that nobody is watching, what a shame and disgrace it is—yes, a disgrace on humanity—that they *too* have been helping themselves instead of fulfilling their oath of office, and protecting the people who elected them! May God help us to bring about a reform and a revival along this very line. May that old tenth commandment —the one winding up the whole list—be held up and glorified by all the world as it has never been held up before—"Thou shalt not covet."

David was a man after God's own heart, we are told; and he was so in his youth, and even until he had got to be pretty well along in life—a man whose life and character pleased God—that is, when compared with the other people in that early period of the world's history. In the 11th chapter of II. Samuel we read, "The Lord sent Nathan unto David." Nathan came and told David the king a little story. I suppose the king understood it was something that recently happened in his domain. There were two men. One of them was very rich, with great flocks and herds. The other was a poor man who had almost nothing, and nothing at all in the way of flocks and herds except one pet lamb which was a great favorite with all the family. Well, this rich man had a visitor, and the rich man was in a hurry to prepare a repast for his guest. But instead of drawing on his own great possessions he sent and got the poor man's pet lamb; and he probably thought that, because of his riches and power, and of his neighbor's helplessness, nothing would be done about it. When David heard of it he was so incensed that he decided, after the fashion of kings in those days, that the rich man should be put to death. This severe punishment was probably to be considered a rebuke, and establish a precedent. After the king had pronounced sentence on this greedy rich man he naturally inquired who it was that had been guilty of such a dastardly act. The old prophet then looked the king squarely in the face and said, "Thou art the man." Oh that we had some such prophets nowadays who would not be afraid to risk their lives, and who would dare to rebuke grievous sins in that way! David had been spoiled by too much prosperity. God, in his loving kindness, had given him every thing. He had wives without number; and, human-like, he was not satisfied. He cast covetous eyes on the wife of another man—the wife of a faithful soldier and a devoted follower of the king; and because this man stood in the way of his greed he caused him to be placed where his loyalty to the king would be the cause of his own death. Oh that we had more men who could stand prosperity and promotion—who could be true steel, no matter how much prosperity and every thing else might be entrusted to their care! May God help us as a people and as a nation.

POULTRY DEPARTMENT

By A. I. ROOT.

CHICKENS IN FLORIDA—MORE ABOUT IT.

When the 60 chicks in that "basket brooder" were, the oldest of them, about two weeks old, their quarters were getting small for them; and as I had in readiness a Clough lampless brooder that I have already mentioned I moved them over on to my newly purchased and fenced acre. This brooder costs $5.00; and the "runway," which is a sort of protected dooryard, is $2.50 more. Well, I sent for the runway *particularly*, to have them secure from prowlers, even if the front door of the brooder was left wide open nights for ventilation. This dooryard is protected on top with ¾-inch-mesh wire netting; and as it is to be placed in front of the brooder right close down on solid ground, the chicks are supposed to be safe. It *did* occur to me that I had heard of animals digging under the edges of the coop or brooder; but as the directions said nothing about further protection I concluded it was safe. The circular declares repeatedly that the complete $7.50 combination is "animal proof;" and the word *animal*, to add emphasis, is in capital letters. Why am I all the while buying *more* brooders, especially when my own ten-cent one is *such* a good one? Well, because I want to get fully *posted* while I am about it. Did you ever have a bunch of chickens that pleased you so much every time you looked at them that you almost feared some calamity *would* befall them? Well, it was only yesterday when I saw those first 28 (that came from the Cyphers incubator) go on exploring expeditions over a great part of their new acre that I said to myself, "How I shall enjoy seeing these lusty fellows grow to big fowls before I go back to Ohio in May!" and then I added in thought, "Surely nothing can happen to *all* of them at any rate;" and then as they came tearing back, some on the wing, I added, "Did anybody ever see such large gauzy wings before, on chickens only fourteen days old?" Well, listen! this morning when I went out to see my pets, before it was quite daylight, I found one sprawled out dead in front of the entrance. I tore off the hover, and the greater part of my flock lay dead and wounded, scattered all over the floor. Just a few were moving a little, and making pitiful peeps of distress. Investigation showed that some animal had dug under the edge of this "animal-proof" runway, and then just "slaughtered the innocents." Five or ten cents' worth of this same ¾-inch netting on the bottom as well

as the top would have saved *me* several dollars' worth of agony.

Let me digress a little. Of late years I find myself getting more and more forgetful. Several times I have gone to the postoffice with important mail and forgot to mail it. I took all the mail out of my box, of course; but again and again I forgot all about the letters tucked away in my inside coat pocket. Finally, one day after I had forgotten to mail some of Mrs. Root's letters I stood up straight, threw back my shoulders, and made a "declaration" (or "declamation") something as follows: "Look here, Sue. This business of forgetting to mail letters has got to be *stopped*. We positively *will not* have any more of it." I think I smiled when I "spoke my piece;" but I was mightily *in earnest*, and I haven't once omitted to put all my mail in the office since. You *can*, my friend, remember important things if you *care enough about it*. If you are undertaking too many things for an old man or woman, then have fewer cares and worries, or carry a memorandum.

Let us get back to the chickens. I for one am done getting chickens up to two weeks old and then letting some *animal* undo all my work in just a few minutes. Poultry-netting is cheap, and it takes only a little time to make the little pets absolutely safe. You ought to be ashamed of yourself; and I for one *am* heartily ashamed of myself. I think I know now that "varmints," at least sometimes, "dig under."

As I write, Wesley is now going clear around our whole two acres, making the inch netting tight down into the ground, and then banking up along the fence besides. We are going to make frequent examinations to see if any prowler has even tried to get in; and, besides this, the chicks are going to be well "barricaded" nights, you may be sure. Wesley thinks we must have fenced in some animal when we enclosed the new acre, and it became so famished was why it killed twenty or thirty chickens when it couldn't eat more than three or four.

One day later.—We set a steel trap and caught him, but he dragged it into the door of the brooder and pulled himself out. He was probably a possum. He not only sorted out the largest and oldest, but, as nearly as I can make out, frightened a lot more to death, for I could discover no injury to their bodies. I say "frightened," because Wesley can't run the new lawn-mower anywhere near the chicks because they go almost crazy with fright. We have found this morning where the animal "dug under" the wire-netting fence also, and got into our enclosure, but we are still on his trail.

MORE TROUBLE.

After the loss, the remnant were put back into their old basket; but a shower coming up they were carried in. As we can't well feed them in the basket, when it let up a little I carried them out to the brooder again; and as it began to rain more I hastily dumped them into the yard before the entrance, the way we hive a swarm of bees, for instance; but the sight of the place (and the memory of the night before) seemed to frighten them so much they scattered in every direction out in the rain. Just at this crisis the rain became a regular downpour. Did you ever try catching chickens while holding an umbrella? I got them in the best I could; but both chicks and myself got a regular soaking, and then the wind swung round to the north and gave us a whiff of your Ohio zero weather just after Christmas.

Well, we have 23 sad-looking chicks left out of our beautiful flock of over 60. It almost makes me think a brooder-house would sometimes be a good thing, even down here in Southern Florida. I have raised chickens, however, down here all winter long for the past three winters, and have had almost no losses at all until just now. Had I stuck to my basket brooder, making another just like the first, when they became too crowded I might have had every chicken even yet. It seems they have got on to pretty nearly the same thing away out in California. Read the following from L. E. Keyser, in the *Petaluma Weekly* of Dec. 15:

> During severe weather I kept these brooders in a hen-house having an open front, and in mild weather set them out in the yard during the day and carried them back into the house at night. This was a good deal of hard work—a thing we are trying to avoid. These brooders were light, being made out of cracker-boxes, and had handles for carrying them by. I never had chicks do better.

This is another striking illustration of how "great minds run in parallel channels;" but why in the world, brother, didn't you take light baskets instead of "cracker-boxes"?

By the way, my experience so far is in favor of a simple burlap sheet over the chicks instead of the ungainly and expensive hovers of woolen "carpet rags" hanging down over the chicks. Philo and Curtiss Bros. both seem to have adopted the burlap sheet. If the weather is very cold it is an easy matter to drop a piece of flannel over the frame holding the burlap. With the 60 in one basket they got too warm, if any thing, whatever was laid over the burlap sheet, even nights when it was down to 40.

I said in a former article the grain for 85 full-grown fowls cost only about 20 cts. a day. Since they are laying more heavily it comes to nearer 30 cts. per day; so we must have at least 9 eggs each day to pay the grain bill. Eggs are still 40 cts. per dozen.

MORE "TROUBLES."

Our efforts to trap the possum resulted in catching him twice; but he pulled out of the best steel trap that could be found in the neighborhood. The last time, he left in the jaws of the trap a piece of his hide, fur and all, almost as big as a half-dollar. Since then he kept away. Wesley suggests that he is finally "convinced." Well, after the possum's visit and the rainstorm's final effects were all over I had 15 chickens left that were getting so strong and well they were exploring again all over the premises. I told Mrs. Root last evening they were now all right, and even the weakest ones wouldn't need any more "hot brick," etc. Their basket

brooder was brought in every night, and placed up on a high work-bench in the woodshed, doors all closed, of course. Well, this morning, although the basket looked all right on the outside, I found six more mutilated chickens and two more missing entirely; and now we have only *seven* left of that beautiful flock of *over 70**. I have written two editorials about *rats* during the past year, and I notice Ernest has another one in our last issue, and yet I have been so stupid as to allow *rats* to get the most of my poor remnant of chickens. It seems I have abundant use, of late, for my little prayer, "Lord, help *me* to learn the lessons thou art trying to teach me." Since I seem called to hunt up and trace out the hindrances to successful poultry culture I will try to learn by experience, and thank God the experience is sent to *me* rather than to some one who is less able to bear it. Mrs. Root suggests that my method of feeding invites rats and other vermin to our premises, and thinks we shall have to stop leaving grain all the time right before the fowls. I have been using all summer (in Ohio) a patented feeder and exerciser, warranted to head off rats, English sparrows, and every thing else. It worked all right for a while; but the sparrows soon learned to come in droves and get right down among the fowls, and grab every grain of wheat the chickens rattled down until they were satisfied; then the chickens could get their fill. I don't see why rats might not do the same. At present a cheap tin can, something like an extractor-can, tall enough so no rat can jump in and out, seems to be the only remedy; but in this case some of the hens seem slow to learn where to go for feed, and thus go hungry. After this you may be sure all my small chickens will be kept nights in a box covered with inch poultry-netting. We are just now making a "rat-proof" brooder house 8×14 feet. This will be so made that it can be all closed up frosty mornings, letting the sunshine in through windows on the south side. We do have a little frost here sometimes. Two nights during the past week the water froze in a pail out by the pump so it took quite a little push with the finger to break it. This is, however, the coldest weather here for many years — Wesley thinks the coldest since the great freeze of 1895.

*Just think of it (if you have had no similar experience), buying baby-chick food, boiled eggs, and meat from the butcher's, in order to have them "just get up and dust," and then when almost three weeks old, and just fairly past the critical time in a chick's life, to have some greedy "varmint" not only eat up the best of them but kill and wound a great lot he could not eat and had no use for! Never mind; it's a pretty bitter "skule," but we are learning.

I have been reading GLEANINGS for a few years, and it is packed full of good things from cover to cover. I inclose a clipping that I thought you would like to place before your readers.

Goffstown, N. H., Dec. 8. G. W. SANDERS.

WHO ARE THE GUILTY ONES?

"Prisoner at the bar," said the judge, "have you any thing to say why sentence of death should not be passed upon you?"

A solemn hush fell over the crowded court-room, and every person waited in almost breathless expectation for the answer to that question.

The judge waited in dignified silence. Not a whisper was heard anywhere, and the situation became painfully oppressive.

Then the prisoner was seen to move. His head was raised, his hands clinched, while the blood rushed to his pale, care-worn face. Suddenly he arose to his feet, and in a low but firm voice said:

"I have, your honor. You have asked me a question; and I now ask, as a last favor on earth, that you will not interrupt my answer until I am through.

"I stand before this bar, convicted of the willful murder of my wife. Truthful witnesses have testified to the fact that I was a loafer, a drunkard, and a wretch; that I returned from one of my prolonged debauches and fired the fatal shot which killed the wife I had sworn to love, cherish, and protect.

"While I have no remembrance of committing the fatal deed, I have no right to complain nor to condemn the verdict of the twelve good men who have acted as jury in this case, for their verdict is in accordance with the evidence which I have heard.

"But, may it please the court, I wish to show that I am not alone responsible for the murder of my wife."

This startling statement created a tremendous sensation. The judge leaned over the desk, the lawyers wheeled around and faced the prisoner, while the jurors looked at each other in amazement.

The prisoner paused a moment, and then continued in the same distinct voice:

"Yes, I repeat it. I am not the only one guilty of the murder of my wife. The judge on this bench, the jury in the box, the lawyers within this bar, and most of the witnesses, including the pastor of the old church, are also guilty, before Almighty God, and will have to stand with me before his judgment throne, where we shall all be righteously judged for all our thoughts, words, and deeds.

"If there had not been saloons in my town I should not have become a drunkard, my wife would not have been murdered, and I should not be here now, ready to be hurled into eternity. Had it not been for these human traps I should have been a sober man, an industrious workman, a tender father, and a loving husband. But to-day my home is destroyed, my little children cast out on to the world, while I am to be hanged by the strong arm of the state.

"God knows I have tried to reform, and prayed for strength to withstand the *licensed* temptation; but so long as the open saloon was in my pathway my weak and diseased will power was no match against the fearful, agonizing, consuming appetite for drink.

"For one year our town was without a saloon. I was one of those who signed the remonstrance against the reopening of saloons in our town. One-half of this jury, the prosecuting attorney on this case, and the judge who sits on this bench, all voted for the saloons. By their votes and influence saloons were reopened, and *they* have helped to make me what I am."

The impassioned words of the prisoner fell like coals of fire upon the hearts of those present. The judge made a motion as if to stop further speech; but the prisoner hastily said, "Your honor, I am nearly through. Do not close my lips." Then he resumed:

"I began my downward career at a saloon bar, licensed and protected by the voters of this town. Had it not been for the license voters, the saloons which have wrecked my life and destroyed my home would not have existed. After the saloons you have established have made me a drunkard and a murderer I am taken before another bar, the bar of justice, and now the law power will conduct me to the place of execution, and hasten my soul into eternity. I shall appear before another bar then—the judgment-bar of God.

"And there you who have licensed the traffic must appear with me. Think you that the great Judge will hold me, the poor weak victim of your saloons, alone responsible for the murder of my wife? Nay! I, in my drunken, frenzied, irresponsible condition, have murdered one; but you have deliberately voted for the saloons which have murdered thousands; and these saloons are in full operation to-day with your consent.

"You licensed the saloons which made me a murderer. I am the logical product of your own votes, and you are guilty with me, before God and man, for the murder of my wife.

"I stand here to-day a condemned murderer, only one of a million, the product of licensed-saloon votes. Let your conscience condemn you who have voted for the rum-shops. There is a remedy, and every sensible man knows what it is. I am done, your honor. You will close by asking God's mercy on my soul. I close by asking the Lord to have mercy on his people, and to open their blind eyes that they may cease to give their votes to consent to the running of licensed murder-mills in our country."